THE LITERARY GAZETTE;

AND

Journal of the Belles Lettres, Arts, Sciences, &c.

No. 1281. LONDON, SATURDAY, AUGUST 7, 1841. PRICE 8d. Stamped Edition, 9d.

THE LITERARY GAZETTE.

☞ The lapse of time, which occasions changes in all things, has, from circumstances of a private nature, led to the purchase of the entire copyright of the *Literary Gazette* by the gentleman who has been the sole Editor and part proprietor from its commencement. Though he has exercised a despotic and independent control over its literature during all that period, it has been difficult to disabuse the public of a certain degree of belief in interested and inimical misrepresentations,—that, being connected with eminent publishers, it was sometimes biased in its views by prepossessions in their favour. There was not a particle of truth in this industriously circulated rumour; but it had, like all often-repeated falsehoods, a partial effect, which we take this opportunity to remove for ever, since the *Literary Gazette* is now entirely unconnected with "the trade."

With so largely increased a stake in its prosperity, the Editor begs leave to say that he will earnestly endeavour to infuse fresh spirit and vigour into its pages; will associate new and able allies in its various departments, and spare neither labour nor cost in making it worthy of general approbation. But to the numerous friends which it has made, and the multitude whom it has brought forward and served in literature, in the arts, in the sciences, and in other refined and intellectual pursuits, he would add, that no combined effort and expense are so effectual in producing excellence, as the assistance and co-operation of individuals who will think it worth while to communicate even the smallest articles of information upon the subjects embraced by the publication. Such aid he respectfully and cordially invites from his personal well-wishers, and from those who have been the well-wishers of the *Gazette* to the present day. Even already, within a few weeks, it has experienced the benefit of this feeling in a singular increase of circulation; and this cheering prospect will further animate the exertions to render it still more deserving of support and patronage.

For the present, we need not trespass beyond this brief announcement of the alteration in the copyright which has taken place, and conclude by hearty thanks to all who have hitherto been our friends.*

* We have resolved hereafter to receive respectable Advertisements of a miscellaneous character; and to make room for them, and the additional and original matter contemplated among our improvements, we shall print extra half-sheets whenever they are necessary: our first next Saturday.

THE BRITISH ASSOCIATION.

In another page of the *Literary Gazette*, and under the usual scientific head, will be found the second part of our Report of the Proceedings of the British Association — at Plymouth, we were going to say; but, owing to the division of the Society between Plymouth and Devonport, we would more correctly say the Proceedings of the Dissociation at Plymouth and Devonport. The Sections, it is true, all meet conveniently enough in the former town; but, in other respects, there has been a want of unity in consequence of the separate arrangements in the rival states. For it behoves us, as veritable historians, to tell that an emulation, not quite so violent as that of Guelph and Ghibelline, subsists between these places, which all the good nature and intervention of Stonehouse fails to conciliate. Thus, instead of ordinaries on alternate days, where all the members might have met together, there has been a divided allegiance, one king presiding here and another there, and the subjects being much at a loss where to evince their appetites, their loyalty, and their love of place. The whole has, nevertheless, worked well; and the Meeting being less numerous than on former occasions, there has been much more of order and quiet, and far less of bustle and mobbing, than we have heretofore experienced.

It is, we find, a considerable advantage to us, and will, we trust, be the same to our readers, that not being called upon to hurry off our earliest despatches in order to meet our first publication after the Sections have gone to work, we have had time, as it were, to look from an eminence embracing both ends of the Meeting. We know what has been done, and we are informed of what is going to be done. Thus, having all, or nearly all, within our view, we are enabled to avoid repetitions, unnecessary details, the statements of opinions which are broached only to be controverted and overturned, and trivial matters brought forward by the less informed, either previously familiar, or speedily and worthily consigned to oblivion by superior intellects; and give the pith and marrow of the transactions in a condensed form and far more limited compass. The diffusion of type is utterly at war with the diffusion of knowledge, and we trust that even our scientific friends will think the *Gazette* account of the Meeting greatly improved by the opportunity of being so conducted.

And there are other reasons which would have induced us to adopt this course, independently of the considerations to which we have alluded. In the first case, the popular publication of the annual volume, at the small price of 4*s*., and within a short time of the dissolution of the Meeting, renders it less onerous on a literary periodical to give imperfect, and they can at the best be but imperfect, reports of the various sectional labours. At these sections brief abstracts are read of the inquiries referred to committees at former periods, the volume will contain their reports in full; and the only way in which we can help the public to a better understanding of the questions which are raised, is by the notice of interesting or important facts which are elicited by *viva voce* discussions after the formal papers are read. And these, dismissing much of controversial and irrelevant verbiage, can be comprised within a narrow compass.

In the second case, we have this year no great scientific novelty, theory, or discovery, brought upon the tapis, and claiming the attention of absent philosophers. There is no voyage to the South Pole to be promoted,—there is no hypothesis of glaciers to astonish the world,—there is no observation of the nature of storms to throw a light upon these terrible visitations,—there is no doctrine and measurement of the waves, or on the forms of vessels (which are now nearly wrought out),—there is no new feature in the grand research into the mysteries of magnetism,—in short, except the idea of following up the investigation of meteorological phenomena by means of balloons, we have heard of nothing very particular in any of the Sections. Let it be understood, however, that in nearly all the branches of science which engage the mind of the Association, steady progress has been made and recorded. Data of high consequence are collected, both to check future mistake and advance future information. Induction, the true basis of all truth, will flourish upon these; and therefore, though there is nothing extraordinary in this stage of the onward journey, the distances and milestones are fairly marked so far, and the prospects in the distance are rendered much more clear and distinct. The way to the field is beaten, and its ample survey defined. There is nothing needed but to march on, take time, and labour to a useful end.

It is probably owing to the circumstances of the year, that there have been some changes made in the disposition of the Meeting. Hitherto the Sections have met, with very slight interruption, on six complete days. On the present occasion there are to be but four day-meetings, and the first day (as is generally the case) had not much to do. The Medical Section has not been able to operate at all (we speak up to Monday morning); and on Saturday, the Physical and Mathematical Section alone assembled. All the rest were holyday making; one numerous body to the coppermines near Tavistock, another up the beautiful Tamar in man-of-war boats, and a third to the Eddystone Lighthouse, where it is believed nobody ever landed yet, save and except the parties who are sent thither to reside and keep up the Vestal flame, only a million of times more valuable to mankind than any fire, however sacred, of ancient Rome. Of these excursions we shall probably give a further description in proper season; suffice it here to add that the weather was favourable, as it has indeed been to this time for all the purposes of the Meeting.

We trust it will be as favourable at *Manchester*, where it is to take place next autumn. Hull, we are informed, though it has frequently invited the Association, has not yet accommodations sufficient for its reception and acting.

With these preliminary remarks we shall now refer our readers to the Report, repeating that we are glad to shape it in the manner we have pointed out by looking at the *ensemble*, rather than at separate points as they occur, with ends often contradicting beginnings; and thus being able to devote our pages to a more equal distribution of the subjects upon which they are commonly employed, and not engross them so exclusively with the science developed at the *réunion* of the British Association.

We shall find room for all that is deserving, so that nothing of interest need be curtailed or omitted.

To the useful and practical we shall pay especial regard; on the merely speculative we shall not dilate. The connexion between various sciences and the comforts and happiness of social life recommends those branches to particular consideration; and whilst the orators of the British Association, in their speeches, honour it by describing its highest attributes and works, we shall not be doing it a slight service by shewing more particularly where, by its inventions and encouragements of clever men, it has

tended to improve the every-day relations of life. Those that read may learn from these something conducive to their advantage or pleasure in every station of our domestic system.

In the proper place the sectional reports of the first day's meeting will be found, with the exception of the statistical details relative to Sheffield; but our readers are aware that, considering the voluminous particulars of statistics, whether in London or the provinces, to be data to be hereafter arranged and tabulated for useful purposes, which, if not given accurately and at full length, can be of no beneficial application to the science, we have abstained from attempting their partial statement within the necessarily contracted space of a periodical like ours. It would, indeed, require volumes to contain the matter brought forward in this branch of inquiry in Plymouth alone, some of it of importance and much of it trivial; but even were it all published, it could be but a crude collection of facts and opinions, destitute of general utility, until combined with other information of similar kinds from every quarter of the country, compared, sifted, analysed, and reconstructed, so as to indicate the changes in our economic, educational, and political system, and required by the existing condition of the people. Still, wherever the subject is so complete as to open the view to local and immediate improvements, it will be our duty and gratification to devote our page sufficiently to the developement of the subject in principle and practice.

Pursuing the history of the proceedings of the body of the Association, we have to notice that in the Committee on Monday it was formally decided that the next meeting should take place in Manchester, and some time in the month of June 1842, the precise period to be fixed by the Council after consulting with the local authorities of the place. The invitations were from the town council, the borough-reeve and constables, the commissioners of police (so that when the time comes the members had better behave themselves), the Literary and Philosophical Society, the Agricultural Society, the Royal Manchester Institution, the Botanical and Horticultural Society, the Medical Board of the Infirmary, the Statistical Society, the Geological Society (of recent formation), the Medical Society, the Mechanics' Institutes of Manchester and of Salford, and the Royal Victoria Association for the Promotion of Science—in short, a unanimous and cordial call of fourteen institutions and associations, which shew the great intellectual working of the mind of this commercial and manufacturing capital, and do honour to its character in the race of nobler cultivation and progress in all the pursuits essential to the well-being and happiness of man.

An invitation from York, the cradle of the British Association, was received and registered for the year 1843; when Professor Phillips assured the Committee there would be found ample accommodation for the most numerous assemblage of the mature and flourishing body, and that both the city and the county were anxious to give it another hearty welcome.

Mr. Neild, a delegate from Manchester, addressed the committee in the names of the municipal authorities and other parties of Manchester, whose wishes he represented; and, on the motion of Colonel Sabine and Mr. J. Taylor, the resolution above mentioned was moved and carried.

The Marquess of Northampton proposed that Lord Francis Egerton should be the President on the occasion, which was also carried with applause, as being equally advantageous and agreeable to the Association and to the inhabitants of Manchester.

The Vice-Presidents chosen were the venerable Dr. Dalton (the chemical glory of that town), Professor Sedgwick, Dr. Henry, Sir Benjamin Heywood, and the Dean of Manchester. The Secretaries, Mr. Peter Clare, Dr. Fleming, and Mr. James Heywood.

The Treasurer was left blank, to be hereafter elected by the Council.

Mr. Hamilton, the enterprising traveller in Asia Minor, who has been acting as secretary to Section C, and whose forthcoming work is looked for with impatient expectation in the literary world, was added to the Committee of Recommendations. Some needful changes in the original list of officers at the present meeting were noticed, and the committee adjourned till Wednesday at three o'clock.—*See Postscript.*

The President's opening address at Devonport, on Thursday evening; the excursions to the Eddystone, the mines near Tavistock, and up the Tamar, on Saturday; and the evening promenades and lectures, &c., will receive due attention from us in succeeding numbers of the *Literary Gazette*. On Monday, the launch of the Hindostan, of eighty guns, and the lighting up of the Caledonia with blue fires, diversified the scientific business; but the weather during the whole day and Tuesday was a continued flood of West-of-England rain, and of most rheumatic and catarrhal influence; so that it was not easy to enjoy these fine sights. The difficulty of procuring conveyances, previously felt as a great inconveniency with the long distances between Plymouth and Devonport, became a real grievance in this intolerable flooding; and the poor philosophers were sad *muddified* spectacles, as they trudged from point to point, like so many human pluviometers, gauging the quantity of moisture which was deluging the streets.

Since writing the foregoing remarks on several prominent aspects of the Association, we have seen that another discussion on what is maintained and denied to be a raised beach, under the Hoe at Plymouth, has sprung up in the Geological Section; and that, in a letter to the Chemical Section, Liebig, the eminent German chemist, gives reasons for his opinion in refutation of the theory of Mr. Brown of Edinburgh, that carbon is convertible into silicon. He maintains that such is *not* the case, and that Mr. Brown is mistaken.

REVIEWS OF NEW BOOKS.

Tour in Austrian Lombardy, the Northern Tyrol, and Bavaria, in 1840. By John Barrow, Esq. 12mo. pp. 375. London, 1841. Murray.

THE public is already indebted to Mr. Barrow for the pleasant account of several pleasant excursions, viz. in the North of Europe, Iceland and Norway, and Ireland; to visit which he has made a good use of his holyday times, bringing back with him not only the knowledge he has acquired, but a disposition to communicate it to others, as we have said, in a very unpretending and lively form. In the present instance, he has not traversed much new ground, or extended his researches beyond tourists already familiar to us, but when we have an intelligent companion whom we like, it is no uncommon thing to have even an old road made so gratifying that we exclaim at the end of our walk, "Well, I did not find it so long as I thought it was." It is so with Mr. Barrow's volume, from which we shall copy a few specimens as examples of the rest. The ascent of the Splügen offers fairly:—

"After a quiet rest, undisturbed by the carriers' vehicles of the preceding night, left the village of Splügen about ten in the morning, and, crossing the wooden bridge over the Rhine with its arched covering, which immediately leads from the village to the opposite or right bank, we took leave of the river altogether, and at once commenced the ascent of the Splügen. We now enjoyed an excellent view of the village we had just left, and the valley, with its numerous little scattered chalets extending round it to the north and south; also of a little stream which, falling through a cleft in the rocks above the village, and passing through the centre of it, was working its way over its rocky bed, with a constant gurgling noise, in its course to the Hinter-Rhein. The rush of water down this little stream is heard to a considerable distance every where around, and receives an increase to its noise by the brawling of another torrent, which pours its tribute down the side of the mountain we were now ascending. We left the carriage, and my companions and self, happening to separate accidentally, kept different tracks in making the ascent; so far apart, indeed, were we at one time, that it was with the greatest difficulty I could distinguish them winding their way up. Always feeling a delight in mountain scenery, I enjoyed my solitary scramble up the Splügen exceedingly; and when I reached the regular windings which the natives call tourniquets, as we sometimes do zig-zags, by which the steepest part of the Pass is scaled, I pursued a direct line up the slope wherever it appeared to be practicable. Large patches of snow were every where lying close by the road-side as we approached the summit, some of last year's, and some which had fallen during the present year; the latter of which was beautifully pure, white and sparkling, so beautiful indeed in its purity, that I could not resist putting a little of it into my mouth, for which, however, I suffered, as I was afterwards told would be the case, by blisters arising on the lips: that is here said to be the invariable consequence of eating snowballs;—but how comes it that no such effect is produced from a practice so common among schoolboys in England? After taxing our memories, we agreed this to be the fact, and simply, I am inclined to believe, from the different quality of the snow, that of the Splügen being composed of small sharp spicula of ice, which require a longer time to melt in the mouth. During my progress up the Splügen, I amused myself with collecting many of the numerous wild flowers, some of which, of a beautiful dark blue colour, and not unlike the campanula, were growing close to the very edge of the snow, and lower down, whole beds of a little white silene. It may be observed, that the fir-trees and larch, which are by no means of stately growth in any part of Switzerland, had here dwindled to a small size, and were observed to be ragged and scraggy even before we reached Splügen. This, however, is not much to be wondered at, when it is recollected that this village was nearly 4500 feet above the level of the sea. These fir-forests had now wholly disappeared; some pretty rhododendrons in full blossom, and other small shrubby Alpine plants, and tufts of grass, supplied the place of the pines, and finally gave way to mosses and lichens. The distance from Splügen to the very summit of the ridge through which the Pass is cut, is said to be about five miles in a direct

line, which, being ascended by a number of these zig-zags already mentioned, is considerably increased in its length of road. A tunnel is also to be passed through along the carriage-road, soon after commencing the ascent from the village, between which and the summit, the whole rise is reckoned at two thousand feet, which would make the height of the crest of the Pass six thousand five hundred feet above the sea. The crest across this Alpine summit is not very broad; it forms the boundary-line between the Grisons in Switzerland and the Austrian Lombardy. It can scarcely be said that there is any actual level space on the summit of the Pass; for the moment the traveller has gained the highest point, he finds himself descending on the opposite side, though for some time very gradually. We passed over it in a thick mist, which prevailed on both sides when we crossed, so that the splendid view, we had promised ourselves, in the two directions of Switzerland and Italy, for such we were well convinced there must be, was entirely obliterated in the fog. So dense, indeed, was it, that we could see nothing of the mountain-peaks on each side of us, and had no opportunity, therefore, of judging to what height they might rise above the Pass, or carriage-road, across the Splügen. As no prospect appeared of the fog clearing away, nothing was left to us but to jog on without murmuring, till we reached the first cantoniera, or house of refuge, which looked as if it were deserted; after which, continuing along our route, we soon arrived at the spot where the Austrian custom-house is established, appearing like a large barrack, the more so as we found it occupied by a small detachment of soldiers. A few mean buildings near it seemed to consist chiefly of taverns for the entertainment and accommodation of the commercial travellers who have to cross these Alps. From the summit to this spot, as well as for some little distance below it, not a shrub of any kind was to be seen near the road; and, indeed, the position of the custom-house is dreary in the extreme: nor did the mist in which it was enveloped tend to improve our opinion of its forlorn situation."

An Italian scena may afford a contrast:—

"Not far from Monza is situated a palace, belonging to the Viceroy of Lombardy, to which we made a visit. It is a building of considerable extent, in the old Italian fashion, situated in an extensive park, some nine or ten miles in circuit: near the palace is a fine garden, tastefully laid out, and well stocked with shrubs and flowering plants, many of them in great luxuriance out of doors, though such as, in our English climate, would only thrive under glass. There was a whole grove of lemon-trees loaded with fruit, and on so extensive a scale, that one of our party observed, 'Here are fine lemons enough to make punch and lemonade for all London for forty years to come.' Myrtles were in great luxuriance, camellias, oleanders, rhododendrons, and magnolias, in beautiful blossom, and tastefully arranged. Most of the common garden flowers were planted in beds of various forms; such as fuchsias, hydrangias, carnations, and, in short, a great display of pinks, stocks, balsams, &c., all in flourishing condition and full flower. The gardener, in shewing us round, brought us to a kind of alcove, with a large swing in it, and some wooden horses, ready saddled and bridled, which turned round on a pivot; and, at a short distance from them, was placed a target for the practice of shooting arrows as the horses were whirling round. These, it seemed, were playthings for the children of the Viceroy, which we discovered only by asking, otherwise might have gone away impressed with the notion that they were for the Viceroy's own amusement. We could not resist getting into the swing of royalty, and while, unconscious of giving offence, I was pushing the swing, the gardener came running in a great stew and stopped our proceedings, having very nearly thrown out my friend on his face, and knocked himself down by the rapid motion of the swing. Our next exploit was to ascend the tower which stands in the garden, and from the summit of which is a fine view of the grounds, with Milan, and the towering spire of the splendid cathedral in the distance. The grounds, including the chase, or park, are said to cover a space, as I have already mentioned, of nine or ten miles in circumference. We were also shewn into a little grotto, in which, by turning a cock, a small stream of water issued, communicating, by its splashing and trickling noise, a pleasant sensation, and rather refreshing in the sultry heat of a mid-day sun; though the smell of some stagnant water in the vicinity was any thing but agreeable. The palace itself—the interior at least—we could not see, and for a droll reason: the viceroy, they told us, had gone that morning to Milan, and had taken the keys in his pocket! We proceeded on our journey to Lecco."

A retrospect of the war in the Tyrol in the year 1809 is very appropriate, and conveys a good idea of the writer's historical talent; but we leave it for a few traits of the ascent of the Stelvio, the highest, we believe, of the Alpine passes. The party set out from the baths of Bormio:—

"The first part of the road is carried along the foot of a bare mountain of rock, on one side; and of a deep ravine or chasm on the other, at the bottom of which the Adda, now reduced to a little stream, rushes along with considerable impetuosity, the source of it being, as we found on gaining the head of the ravine, distinctly visible on the opposite side. A little beyond this afforded us the sight of a beautiful cascade, leaping from ledge to ledge of the projecting rocks, which, adding as it does considerably to the waters of the Adda, may be considered as one of its sources. Indeed, the whole of the slate-rock strata abounds with so many little rills and jets of water pouring out of their sides, that they all may be considered as contributors to the main stream. From this elevated point, looking back to the southward, the view of the dark and naked mountains which hem in the deep chasm, with their snow-capped summits, is exceedingly fine; in the contrary direction, or in the line of our progress, it was here entirely closed against us. The road, though steep, was generally good and even; in some parts it passed through tunnels of considerable length cut through the projecting rock. In one or two places were tunnels built of masonry and covered with wooden roofs, sloping with the same declivity as the side of the mountain at the foot of which they were built. The intention of these was the preservation of the road against the fall of masses of snow or avalanches of rocks, which, by rolling over the roof, are thrown forward and precipitated into the gulf below. * * * Soon after this we attained the highest summit of the Pass of the Stelvio, which is marked by a granite column, and through which passes the boundary line that divides Lombardy, and Switzerland also, from the Tyrol. The difficulty of measuring the height of mountains like those of the Tyrol, where frequently no base line can be had, and the barometer, in such a situation, being an imperfect instrument for the purpose, is fully apparent in the different heights assigned to the Pass of the Stelvio. Perhaps Mr. Brockedon's will be the most accurate of any. He says, it is the highest pass in the world traversable for carriages, being 2417 feet higher than the crest of the passage of the Mont Cenis, and 780 feet higher than the estimated line of perpetual snow in the latitude of the Stelvio. The crest or highest ridge of Mont Cenis is 11,460 feet; but—

The crest of the Pass is	6773 ft.
Add	2417
Pass of the Stelvio	9190

This is probably near the truth, as Murray, in his 'Hand-book,' sets it down (but gives no authority) at 9270 feet above the level of the sea. But both are certainly wrong with regard to the line of perpetual snow: Murray stating it at 800 feet only below the summit, and Brockedon at 780 feet; whereas the curve of perpetual congelation in 46½° of latitude is 7250 feet, consequently that line will be at 1940 feet below the pass; and the fact is, that in the hottest part of summer snow surrounded it on all sides. The view that now bursts upon the sight on reaching the summit of the pass is superior to that of any Alpine scenery I have witnessed—the Simplon, the St. Gothard, the Splügen, bearing no comparison with it. It is a view so vast and comprehensive, and of objects so stupendous, as to impress on the mind of the observer a feeling of reverence and awe, and perhaps of humiliation also, to find himself a mere atom in the creation, surrounded by some of the most sublime among the varied and manifold scenes which the hand of Nature has supplied for the contemplation of man.

'All that expands the spirit, yet appals,
Gather around these summits, as to shew
How earth may pierce to heaven, yet leave vain man
below.'

A succession of peaked rocks, rising one above another as far as the eye can reach, whose dark masses are seen protruding from the pure white glittering snow, and the frowning glaciers suspended from their sides, the varied hues which clouds and sunshine alternately impart,—the magnificent mountain of the Ortler-Spitz, towering above all the rest, and crowning the head of the valley with its peaked summit, just rising to a height of not less than 14,400 feet above the level of the sea,—all these grouped together in one cluster, as it were, present to the mind of the spectator a picture of grandeur and sublimity, that no time can efface, and no description, either with pen or pencil, convey. We now commenced the descent into the Tyrol, and were glad that our route had brought us into that country at a point of view so favourable and so magnificent. Bearing in mind the character one has heard of the Tyrolean Alps, it is, of all others, the precise point at which, from its bold and majestic features, one would wish to arrive, and be told —'This is the Tyrol.' All that the traveller could have imagined of magnificent mountain scenery, of black and rugged rocks, contrasted with pure white snows and gloomy glaciers, would here seem to be realised to the fullest extent. It is at such spots as these, while enjoying the glorious scenes of Nature, in all her wildness and awful sublimity, that the labour and fatigue of travel, or its numerous petty annoyances, are felt to be trifles, well

compensated. It is in the gratification which such scenes and such spots as these afford that, while enjoying the pure mountain air, and the elasticity of spirits derived therefrom, we feel the full force of, and are apt to repeat to ourselves, the expressive lines of 'Childe Harold,' as I.e—

'—— winds through many a pleasant place,
Though sluggards deem it but a foolish chase,
And marvel men should quit their easy chair,
The toilsome way, and long, long league to trace,
Oh! there is sweetness in the mountain air
And life, that bloated ease can never hope to share.'"

The precipitous descent into the Tyrol suggests nothing to us for extract; nor shall we meddle with Innsbruck or Munich, though both are well described. The following notice alone must close our extracts. Near Mals, Mr. B. observed "a figure in wood of our Saviour, made use of as a fountain, and projecting from his side was a long iron pipe, out of which was flowing a constant stream of water into a reservoir. The figure was miserably carved, as, indeed, are all those of a similar description, that occur by the road-side, the number of which are almost incredible, even more frequent than in Switzerland. In Italy, we noticed that these wooden figures were less common than al-fresco paintings, generally representing some saint or martyr pierced through with arrows, equally abundant by the sides of the public roads; in no instance, however, did we observe any representation of Christ so vilely, though, I am sure, unintentionally, desecrated as here."

Mr. B. writes so neatly and intelligibly, that we are glad, in our right of critics, to point out the following little bit of confusion in expression:—

"There is another inconvenience which requires the utmost attention of travellers themselves, on their arrival by railroad at Malines, and thence prosecuting their journey. As almost all the trains assemble on their respective routes at this central station, it may naturally be expected that much bustle and confusion will ensue *by the removal of passengers and their baggage* to the proper trains; and it behoves a passenger to look well after *both*, lest *he should be carried in a contrary direction to that of his intended destination, or be left behind altogether*."

Evils and Remedies of the Present System of Popular Elections, with a Sketch of the Qualifications and Duties of Representatives and Constituents; to which is added, an Address on the proposed Reforms in the Commerce and Finance of the Country. By J. S. Buckingham, Esq. 12mo. pp. 315. London, 1841. Simpkin, Marshall, and Co.

"AT present, therefore, within less than ten years after the passing of a bill which was hailed with universal delight by all the reformers of the kingdom, there is, perhaps, no one subject on which the same party are so entirely agreed as this,—that the bill is one of the most imperfect and inefficient measures ever passed through the British Parliament, and that it demands an immediate repeal and an entire reconstruction."

Such is the writer's opinion of this great measure, and he proposes as remedies, to increase the number of electors; to generalise elective franchise, instead of confining it within certain district, town, or county boundaries; to make property or rental no longer a standard for voting; to put an end to fagot votes and burgage tenures created for that purpose; to render disfranchisement more difficult; to open facilities for registration; to guard more against fictitious voters representing the absent or the dead; to curb and regulate election petitions: all engendering—

"First, Enormous expense to individuals in every case of a contested election, whether for counties or boroughs; enormous expense to the country, for the army of revising barristers, and other machinery necessary for effecting and revising the registration; and ruinous expense to those petitioned against after their election has been secured. Secondly, Bribery, corruption, and intimidation, in many instances as great as, and in some instances even greater than, under the old system of things. And, thirdly, The engendering of so much anger, ill-will, and disgust, as to induce those who take part in elections at all to use any and every means, honourable or dishonourable, to crush their opponents; and to compel many, who cannot conscientiously stoop to this, to withdraw from political agitation altogether."

Mr. Buckingham proceeds to give the four qualifications he would require in a voter, and they are,—

"1. The attainment of full legal age.
2. The possession of a good moral character for sobriety and integrity.
3. The capacity to earn an independent subsistence.
4. The ability to read and write English."

Whereupon we would observe that each of these would be liable to great dispute:—

1. A year or two of age would be a fine question for canvassers, assessors, barristers, *et hoc genus omne* at election contests.

2. Who is to judge of the moral character? there is no criterion, and the bare idea of trying a man's bumpers before he gave his plumpers suggests a pleasant farce.

3. The capacity to earn may be employed or unemployed. How is that to be settled?

4. The ability to read and write English, if understood to mean good English, well pronounced in reading and grammatical in writing, would disfranchise not only ninety-nine in a hundred of the present or any other constituency, but nearly as many of the candidates for parliamentary honours and legislative functions.

Feeling these objections to the author's principles, we need not go into his details. The system is a beautiful Temperance vision—penned, as we are informed, whilst steaming on the vast Atlantic Ocean; perhaps applicable to that site or meridian, but sure we are impossible to be adapted to the population of England, Scotland, or even Ireland.

The other parts of the volume are not new, but repeat the author's opinions well known to the public through his lectures, addresses, and publications. Mr. B. is a man of strong sense and much information, but on many points he is somewhat of a visionary and theorist.

WRIGHT'S HISTORY OF LUDLOW. PART I.
[Second notice: conclusion.]

THE whole of the second Section, which presents us with a view of the Welsh Border under the Conqueror, is well worth the careful perusal, and shews as curious a transition period as any with which we are acquainted in local history:—

"During nearly a century, the Marches of Wales had been exposed to the continual ravages of the Danes or the Welsh. Ruins occupied the sites of what had been flourishing towns; churches, monasteries, and even castles, had been destroyed; lands, formerly cultivated, lay waste, and were overrun with trees and brushwood. * * * If one Welshman slew another, the relatives of the slain were to assemble and plunder the lands of the slayer and of his relatives, and burn their houses, until the noon of the following day, when the body was to be buried: of the prey they thus collected, the king claimed one-third, and the plunderers were allowed to appropriate the rest."

And this remarkable passage in the Domesday Book proves that at the remote period referred to, the King of England laid claim to a feudal superiority over Wales, whenever he could exercise it:—

"Under the Saxons this part of the island was much more densely wooded than at present. The woodlands of our times are, as it were, the skeleton of the extensive forests of former days, which were thickest and most considerable in the tract of country between Ludlow and Leominster and the Welsh territory. * * * The woods were not the least profitable part of the ground, for they gave food to numerous herds of swine, the flesh of which formed the most general article of animal food among our forefathers during the middle ages. The stores of the baron's castle, equally with those of the peasant hut, consisted chiefly in bacon; and from this circumstance is derived the name which we still give to the place in which our meat is preserved, a larder (*lardarium*). The extent of a wood was frequently estimated by the number of these animals which it would support. Thus, at Caynham, there was in the days of the Conqueror 'a wood of two hundred swine,' at Burford there was 'a wood of one hundred swine.' Another article produced in abundance on the waste lands (frequently covered with thyme), and which was infinitely more in use among our early forefathers than at present, was honey. The rivers and streams gave motion then, as now, to numerous corn-mills. At Ludford there was a mill, the only one mentioned in the neighbourhood of Ludlow; at Little Hereford there were four mills; Caynham had one mill; Burford, two. Another article which was then reckoned a part of the produce of landed estates, was fish, particularly eels. Among the ancient Germanic tribes, fresh-water fish were considered as game, and protected as such: an early Teutonic law allowed the unqualified person to have only as much as he could take by walking into the water and catching them with his hand. The corn-lands were tolerably extensive, and were generally uninclosed. The fields in which cattle were kept were, on the contrary, inclosed. To these inclosures our Anglo-Saxon forefathers gave the name of *tun*, our modern word *town*, though it then conveyed no idea of buildings, but meant simply a space inclosed by a hedge: *wyrt-tun*, *i.e.* herb-town, was a garden; *gærs-tun*, *i.e.* grass-town, was a meadow. The Normans called these inclosures *haies*, in Low-Latin, *hagæ* or *haiæ*, the origin of our word hedges. The more modern English name for such inclosures is a *close*. In the earliest collection of Anglo-Saxon laws, those of Athelbriht, king of Kent, at the end of the sixth century, it is set down as a grievous offence to break through a man's hedge, or *tun*."

The foregoing are but patches of the interesting information with which Mr. Wright has enriched his work; and to such an extent, that we should not know where else to look for such accurate traits of the manners of our forefathers in so condensed and connected a form. The etymological researches and statements respecting the origin of the names of places, are also, as will be seen from these

quotations, of a very useful kind; and yet the learned and unlearned are not left to dwell on dry inquiries, but the author turns with his page to some memorable popular legend of these old times, and gives us stories which might charm the most imaginative lovers of fiction. Thus we are told:—

"Many local legends might still be gathered from the mouths of the peasantry on the Welsh borders. At the extremity of the roof of the north transept of Ludlow Church is placed an iron arrow. According to a popular legend still repeated, Robin Hood stood on the larger mound or low at the Old Field, and aimed this arrow at the weathercock of the church, but, falling a few yards short of its intended destination, it has ever since remained in the place where it fixed itself. The arrow simply indicates that this was the Fletcher's chancel; but the legend, made to explain its position, after the use of arrows was laid aside and forgotten, was probably engrafted on the tradition of a former legend which connected the low in the Old Field with the larger low which formerly occupied the site of the present church; the one was visible from the other. As parts of the country became less wild, the fear of dragons gradually passed away, and the popular mythology became modified. The lows were then supposed to be the abode of elves and fairies; and there were people who believed that in the dead of night the entrance became visible, and that the under-ground people might be seen issuing forth to frolic and gambol on the face of the earth. There can be no doubt that the Marches of Wales were once rich in fairy legends. In the reign of Henry VIII., when Leland visited the border, the ruins of the Kenchester, then very extensive, were believed to have been taken possession of by the diminutive beings of the popular creed; the Roman coins frequently found there were called *fairy-money*; and one more considerable mass of building had received the name of the 'king of faeries' chair.' Other legends of a more terrific character were at an early period connected with the ruined sites of the ancient towns. At the time of the composition of the Romance of the Fitz Warines, probably before the middle of the thirteenth century, a ruined city, which may possibly have been Wroxeter, was believed to have been inhabited by the devil, who guarded the vast treasures which were concealed there, and held his revels with hosts of other fiends in its desolate halls. The pagan Anglo-Saxons were in the habit of giving the names of their gods to things which were wonderful or extraordinary, or which moved their superstitious feelings. When they obtained possession of this island, nothing seems to have excited their admiration more than the great Roman military ways. One of their deities whose name appears to have had a very wide influence, was named Eormen or Ermin. It frequently entered into the composition of the names of persons of rank: *Herminius* led our forefathers, then a tribe settled in Germany, against the Romans; *Ermanaric* was one of the greatest of the Gothic princes; in early German such names as *Irmandeo*, *Irmanperaht*, *Irmanfrit*, *Irmangart*, were common; in Anglo-Saxon we have *Eormenric* (the same as Ermaneric), king of Kent in 568, whose great-grandson *Eormenred* gave to his three daughters the names *Eormenberga*, *Eormenburgha*, and *Eormengytha*. *Irmin-sul* was one of the great objects of worship to the Germanic tribe on the Continent. *Eormen*-leaf was the Anglo-Saxon name of the mallow (*malva erratica*), which was believed to possess many miraculous virtues. There can scarcely be a doubt that this is the origin of the name given by the Anglo-Saxons to one of the great roads—*Eormen-stræt*, Ermin-street, or Irming street. In a similar manner, to another of the great roads the Anglo-Saxons gave the name of *Wætlinga-stræt*, which means literally *the street of the sons of Watla*, for Wætlinga is the genitive case plural of a patronymic. If more of the ancient Anglo-Saxon mythic poetry were preserved, we should doubtlessly find that Wætla was a mythological personage. Florence of Worcester, who wrote when this poetry was in being, calls the Watling-street, '*Strata quam filii Watlæ regis straverunt.*' It is very singular that our forefathers gave the name of Watling-street, or Wætlinga-stræt to the milky-way in the heavens as well as to the Roman road; and we find also that among the old Germanic tribes the name Iringes-wec (Iring's way) composed of a name *Iring* closely allied to that of *Irmin*, was given to an ancient road and at the same time to the milky-way. In the Vilkunga Saga this road is called Irúngsveggr. It may be observed also that among the ancient Germans the polar constellation was named *Irmins-wagen*, or Irmin's wagon."

And so forth through many an interesting nationality!

The fourth section, relating the adventures of the younger Fulke Fitz Warine, is an admirable romance of chivalry and Robin-Hoodism, and the character of the times, within twenty pages. We select a passage of the freebooting class:—

"Intelligence was carried to King John's knights, who were in search of him, that Fulke Fitz Warine was in a certain wood; and they immediately raised the country about, and came with a great number of people of all sorts to surround the place where he was lodged. They placed bands of men on every side to watch his egress, and distributed watchmen over the fields and plains with horns to raise the cry if they saw him pass from his hiding-place. The first intelligence of these movements which reached Fulke was conveyed by the horn of one of his pursuers, who was at no great distance from him. Fulke and his companions instantly mounted their steeds, and with all their company, horse and foot, they issued from the forest. After several rude encounters, in which many of their pursuers were slain, and in one of which John Fitz Warine received a severe wound on the head, the whole party got clear of the snares which were laid for them, and pursued the highroad till they came to an abbey. Here Alan Fitz Warine, having secured the porter and taken possession of the keys, sheltered the whole company within the walls, except Fulke, who, dressed in the guise of an old monk, took a great club and supported himself upon it, and, limping with one foot, walked very slowly along the road-side. He had not been long there before a large body of knights, serjeants, and their company, arrived at full speed. 'Old monk,' said they, 'have you seen no knights in armour pass here?' 'Yes,' said Fulke, 'and God repay them the hurt they have done me!' 'And what hurt have they done you?' said the knight who was foremost. 'Sir,' said Fulke, 'I am very old and decrepit, and with difficulty help myself. On a sudden there came seven knights and fifteen men on foot, and because I could not get out of the way, they made no stoppage, but run over me, and it was a chance that I had not been killed.' 'Never mind,' said the knight, 'before night I promise thou shalt be well avenged;' and without more words the whole party continued their route at full speed. Soon afterwards arrived eleven other knights, magnificently mounted on choice steeds. As they approached the place where Fulke was standing, the chief of them burst into a fit of laughter, and said, 'Here is an old fat monk, who has a fine belly to hold two gallons in it!' Fulke, without uttering a word, raised his club, and struck the knight such a fearful blow under the ear as laid him breathless on the ground. His brothers and their companions, who were looking on, rushed from the abbey, and, seizing upon the knights, bound them and locked them up in the porter's lodge, and, taking the horses, they mounted their whole company, and rode without making any considerable pause till they came to 'Huggeford,' where John Fitz Warine was cured of his wound."

We cannot deny ourselves the pleasure of quoting another of Fulke's adventures with the hostile king himself:—

"Hearing that King John was at Windsor, Fulke and his companions directed their course thither, travelling by night, and seeking repose and concealment by day, till they reached Windsor forest, where they lodged themselves in an unfrequented place which they had formerly occupied, for they were well acquainted with every part of the forest. They had not been there long before they learned, by the sounding of horns and the shouts of the foresters, that the king was gone to the chase. While his companions armed and placed themselves in ambush, Fulke went out alone to seek adventures. As he walked along, he met with a charbonnier, or maker of charcoal, who was poorly dressed and black with the dust of the charcoal, and carried in his hand a three-pronged fork. Having changed his dress with this man, and disguised himself as a charbonnier, Fulke seated himself by the pile of charcoal, and, taking the fork in his hand, began to stir and arrange the fire. While he was thus busied, the king rode up to the spot, attended only by three knights; on which Fulke, imitating the gestures of a peasant, threw aside his fork, and fell on his knees very humbly before him. At first the king laughed and joked at his grim look and dirty garments; then he said, 'Master clown, have you seen any buck or doe pass this way?' Fulke answered, 'Yes, my lord, just now.' 'What kind of beast was it?' 'Sire, my lord, a horned one, and it had long horns.' 'Where is it gone?' 'Sire, my lord, I could easily lead you to the place where I saw it.' 'Go on, then, clown, and we will follow.' 'Sire,' said the pretended charbonnier, 'may I take my fork in my hand? for, if any one stole it, it would be a great loss to me.' 'Yes, clown,' said the king, 'if you like;' and thus Fulke led the king and his three knights to the spot where his companions were concealed, who came out and made them prisoners; and only set them free after the king had given his solemn oath to pardon them all, and restore them to their lands."

Fulke, after many other strange and eventful courses, was finally pardoned, and, with his outlaw companions, received into royal favour. Their names are recited in the pardon dated at Rouen, 11th of Nov. 1203.

An anecdote of the lady of another noble at the beginning of the reign of King John is also highly illustrative of that turbulent age:—

"William de Braose, lord of Builth and Brecknock, and allied by kindred to the Lacies and most of the great border families, was deeply hated by the Welsh, and was constantly engaged in hostilities with their princes. His wife, Maude de Saint Waleri, was one of the most remarkable women of her time, and was no less active in the wars than her husband. At the beginning of the turbulent reign of John, she and her husband enjoyed the royal favour. She on one occasion presented to the queen three hundred cows and one bull, all of them white, with red ears; and she boasted that she possessed above twelve thousand milch cows, and that she had in her stores so many cheeses, that if a hundred of the most vigorous men in England were besieged in a castle during a month, and if they were obliged to defend themselves by continually throwing her cheeses at the assailants, let them throw them as fast as they might, they would still have some left at the end of the month. William de Braose and his wife soon incurred the displeasure of King John; they returned a proud answer to his message, and he went with an army towards Wales. On his approach, William de Braose fled to France, and Maude with her eldest son William went over to Ireland to seek protection from their kinsman Hugh de Lacy, who was likewise under the king's displeasure. As John pursued them from castle to castle in Ireland, they fled to the Isle of Man and to Scotland, where Maude and her son William were taken and sent to the king. He ordered them to be inclosed in a room in Corfe Castle, with a sheaf of wheat and a piece of raw bacon for their only provisions. On the eleventh day their prison was opened, and they were found both dead; the mother was sitting upright between her son's legs with her head leaning back on his breast, whilst he was also in a sitting posture with his face turned towards the ground. Maude de Braose, in her last pangs of hunger, had gnawed the cheeks of her son, then probably dead, and after this effort she appeared to have fallen into the position in which she was found."*

With this extract we must conclude, though strongly tempted by the account of the foundation of Wigmore Abbey, so full of monastic matter; but to have allotted two Nos. of our *Gazette* to only the first Part of a work consisting of 132 pages, will shew the estimation in which we hold it. For mixing research, learning, and popular reading, into one happy compound, the *History of Ludlow*, &c. bids fair to be among the most successful works of its class produced in and for England.

ARTS AND SCIENCES.

BRITISH ASSOCIATION.

THURSDAY.

SECTION A.—*Mathematical and Physical Science. Papers and Communications.*

1. Sir J. W. Herschel's 'Report of Committee for the Reduction of La Caille's Stars in the Cœlum Australe.'
2. The Astronomer Royal's 'Report on the Publication of the Hourly Meteorological Observations made at Plymouth, under the Superintendence of Mr. W. S. Harris.'
3. Rev. Professor Whewell's 'Reports on Tides at Leith and Bristol.'
4. Sir J. W. Lubbock's 'Report of the Committee for considering the Use of Balloons in Promoting our Knowledge of the Constitution of the Upper Strata of the Atmosphere.'
5. Rev. Professor Powell, 'On the Theoretical Computation of Refractive Indices.'
6. Rev. Professor Powell, 'On the Refraction of Heat.'
7. Professor Powell, 'On Certain Points of the Wave Theory of Light.'

Sir J. Herschel's Report announced the great progress made and making in the duty entrusted to the committee for the reduction of La Caille's stars, as above (No. 1).

Professor Airy's Report called up Colonel Sabine, Professors Whewell and Stevelly. The form and mode in which the hourly observations made in Plymouth, at Trevandrum, and elsewhere, already received in tabulated forms, and the vast masses to be transmitted now regularly from the many newly established observatories, Colonel Sabine stated, is a subject for serious consideration.

Professor Whewell commented on the vast accumulation for the basis of meteorology as a science, and the immense labour which Mr. Snow Harris's observations involve. The variations of the barometer and thermometer have been recorded for every hour of the day and of the night. The Astronomer Royal is well known, he said, to be chary of expressions of approbation, but Mr. Harris's work has called even from him words of praise. The observations that established astronomy continuing for years—continuing for generations, did not strike the world as any thing extraordinary; but nobody can look at, without admiring, the efforts making to reduce meteorology to a science.

Professor Stevelly drew attention to the beautiful instruments employed by Mr. Harris, and to his delicate contrivance whereby the barometer could be read off accurately to the tenthousandth part of an inch.

Professor Lloyd congratulated the Section on the prospect of the publication of these valuable details.

Report (No. 3) was next submitted, prefaced by remarks from Professor Whewell. "The subject of tides," he said, "for a long time has been a matter of reproach, which the unlearned have felt the right to pass on the learned. 'After all, you learned know but little of the tides.' This will soon be only traditional; for now a great deal is known, and almost to a minute can the time and place of high tide be predicted." After years of labour, there remain but few facts in relation to tidal phenomena to observe, unless, indeed, in remote countries, or more especially in the Pacific, whence observations would be valuable. The former Reports explained the epoch of alternations of high water dependent on the parallax or apparent size of the moon, and of her declination or her position, high or low, in the heavens; also, on the parallax and declination of the sun; but neither calculated for the day on which high water was observed, at Bristol for instance. The tidal wave had origin in the ocean, and there received the forces to determine its height. The epoch of parallax and declination therefore would be anterior to the time of observation, and the best epoch has been determined to be between thirty-eight and forty-four hours before the time of high water. This discovery, the result of enormous labour and years of observations reduced, enables the calculator to project a curve (the elementary curve of prediction), which the tides ought to follow; but the observed tides deviated therefrom. Some residual phenomena were to be included in the reduction for correction, involving only inches in the height, for the epoch before described explained the fact. The remaining irregularities were so trifling, that Professor Whewell, wishing to wind up the inquiry, was desirous to pass them by. On the 14th January, 1841, however, Mr. Bunt stated in a letter that he was led to conceive that the pressure of the atmosphere had somewhat to do with the irregularities. This is not an entirely new idea, although through the intelligence, zeal, and perseverance of Mr. Bunt, a new and important result has been realised.

We need not detail the mode or the repeated elaborations of calculation adopted by Mr. Bunt; suffice it to say, he has determined the epoch of the barometer to be contemporaneous, that is, that the height of the tide varies according to the pressure of the atmosphere at the time of observation, and not as in the epoch of parallax and declination, a day and a half antecedent; nor of any time subsequent, but, as before said, contemporaneous with the observation. And further, he has established, that for every inch of variation in the barometer, a rise or fall of the tide to the extent of about fourteen inches ensues; and this coincides very nearly with the difference between the specific gravities of mercury and water.

A conversation ensued with regard to some minor points, but the speakers all agreed as to the exceedingly satisfactory results of the investigation, and as to the great tidal question being now soon set at rest. The observations at Leith extended over a period of several years, ending in 1840; and they afforded means of obtaining the correction of parallax and declination at that port. Professor Whewell submitted Mr. Ross's Tables as the Report, stating that he thought it desirable to connect the observations at Leith with those of other places; for which purpose he intended to apply for the grant to be renewed for 50*l*. He further remarked on the value of such tables, and on the already apparent agreement of observations with the equilibrium theory.

Report No. 4 was a printed one, full of, in our opinion, unnecessary minuteness and reference to the observations of public aeronauts; and although it discouraged the use of balloons as yet for the investigation of the constitution of the upper strata of the atmosphere, it described the instruments best suited for the inquiry, in case accidental aeronauts should wish to observe and record. This was not the only contradiction this report afforded; but the second promises well as to the consequence.

Dr. Robison of Armagh, no mean authority in these matters, and one of the committee who signed the report, objected in part to its contents. He said it contained the truth, but not the whole truth; and although he had signed it, he did not altogether acquiesce in it. He was of opinion that the condition of the constitution of the higher atmosphere was most important to the physicist; and he thought the attainment of considerable information was practicable. As yet, we know little more than the facts of the decrease of temperature, the diminished pressure, the variation in the vapour of water in ascending. Still more obscure is the electrical state of the atmosphere; and of the laws which regulate these several states we know nothing. The balloon investigation was once attempted at the expense of Napoleon; twenty-one ascents were made, but no results were obtained. The observations of Gay Lussac contain errors so enormous, that with all the powers of reducing we now possess they are useless. Gay Lussac himself says, the position of an observer six or seven-and-twenty thousand feet above the earth is not one of ease, and causes a certain degree of embarrassment. The records of aeronauts for exhibition cannot

* "These particulars relating to the Braoses, differing considerably from the accounts commonly received, are taken from an anonymous writer who lived at the time, and was intimately acquainted with the domestic events of the reign of John: his work, in a strong Norman dialect, was first printed by the Société de l'Histoire de France, in 8vo. 1840. The account of Maude de Braose will be found at pp. 111-115."

be expected to be correct, and incorrect ones are worse than useless. Dr. Robison thinks that by means of a captive or moored balloon, the investigation is practicable, as also by the beautiful known modes of observation—the registering the facts without lowering the balloon. This, he believed, might be done at least to a height from 500 to 1000 yards, and contributions of this kind are considered by every physicist most valuable. He had turned it much in his mind, and he had come to the determination to apply for a grant for the purpose. It may happen, he said, that the result will be so important as to induce government to assist in the prosecution of the inquiry. Government, he concluded, never failed to assist when the British Association considered themselves in a position to apply.

Professor Whewell, another subscriber to the Report, also felt that it contained tones of despondency; but there were personal feelings which he did not think justified him in withholding his signature. Undoubtedly, he said, philosophers had no right to speculate on the atmosphere, the constitution of the higher strata of which it was impossible to know without numerous observations; and it was a disgrace that so much speculation had been indulged in, founded only on the observations of Gay Lussac. He felt that, however arduous the undertaking, there should be no despondency. If the expense be enormous, the results also might be enormous. The funds of the Association are large and are not to be hoarded; and it was with extreme satisfaction that he heard that Dr. Robison had turned in his mind a plan for success. He was persuaded, that soon we shall know much of the condition of the higher strata of the atmosphere.

Suggestions were thrown out by Mr. Walker and Professor Stevelly, for the increasing or diminishing the volume of the balloon by mechanical means, whereby the balloon may be made to rise or fall and much expense saved.

Dr. Robison desired, on this occasion, to record his wish for the inquiry. The expense of the preliminary investigation would be only 20*l*. He further stated, that Capt. James Ross has sent home the expression of his wish for a balloon to investigate the atmospheric condition of the southern regions. This was an additional impetus to him (Dr. Robison), and he was authorised to say that the government were ready to supply Capt. James Ross and "assist us;" and that they had proffered the Woolwich manufactory for the prosecution of the preliminary experiments.

This announcement was received (to use Professor Whewell's favourite expression) with extreme satisfaction by the Section.

The last three in the list are of that description, for the particulars of which we refer our scientific readers to the forthcoming volume of Transactions, which, as we have before said, will be distributed in four months' time to all members.

SECTION B.—*Chemistry and Mineralogy.*
Papers and Communications.

1. 'On the Influence of the Ferrocyanate of Potash on the Iodide of Silver, forming a highly Sensitive Photographic Preparation,' by Mr. Robert Hunt.
2. 'An Inquiry into the Natural Properties of the New Element or Product of Electric Action mentioned by Schönbein,' by Mr. Frederick De Moleyn.
3. Mr. De Moleyn also announced the 'Discovery of a Voltaic Combination of extraordinary Energy,' which he hoped to exhibit to the Section before the close of the Meeting.

Mr. Hunt read his paper 'On the Influence of the Ferrocyanate of Potash on the Iodide of Silver, forming a highly Sensitive Photographic Preparation.'

F. De Moleyn, Esq. M.A., read a paper entitled 'Some Researches on the Developement of Electrical Force.' Part the 1st, An Inquiry into the Nature and Properties of the New Element or Product of Electrical Action described by Schönbein. Part 2d, On the Discovery of a Voltaic Combination of Extraordinary Energy.

Mr. De Moleyn commenced by observing—"That we are on the eve of some extraordinary discoveries in electro-chemical science which will most probably effect an entire change in the views of chemical relations at present entertained, there can scarcely exist a doubt. The doctrine of substitutions of Dumas—the strong proofs of the identity of silicon and carbon—the fact of the capability of the same body to crystallise in forms belonging to two different systems—the observations of Schönbein which formed the groundwork of the first part of the subject of the present paper, with various other singular results recently obtained by eminent philosophers, fully sanctioned this opinion. The interesting character of the facts newly brought to light, and the confessed inadequacy of the various theories presented to the world since the commencement of the present century to explain or reconcile these modern results of laborious investigation, furnished good ground for fresh inquiry, and encouraged new labourers to enter the field of science." Mr. De Moleyn proceeded to say, that the statement made by Professor Schönbein at the Glasgow Meeting, respecting the production of a new element which he called *Ozone*, early attracted his attention, from his having, in the course of his electrical experiments, been struck by the singularity of the peculiar odour which the power of the batteries he employed produced to such a degree as to determine him, if possible, to solve the mystery. The paper now read contained some of the more important results he had obtained. In the report alluded to, which was read at the Glasgow Meeting, Professor Schönbein stated that the disengagement of the "odorous substance" depended, 1st, Upon the nature of the positive electrodes; 2d, Upon the chemical constitution of the electrolytic fluid; and 3d, Upon the temperature of that fluid. He added, that his experiments went to shew that well-cleaned gold and platina were *alone* capable of disengaging the odoriferous principle, and that the more easily oxidable metals, as well as charcoal, did not possess that property at all. The results of Mr. De Moleyn's investigation fully proved,—1. That the disengagement of the peculiar odour was not confined to the less easily oxidable metals. 2. That by certain arrangements all metals, when positive electrodes, may be made to develope the odoriferous principle. 3. That certain positive metals, not acting as electrodes, will evolve this principle. 4. That charcoal forms no exception to this rule. 5. That all substances, whether crystalline in structure or otherwise, possessing the property of appearing luminous by friction, or of yielding sparks when struck, also possess the property of discharging, under such circumstances, the "peculiar odour." 6. That iron and nickel develope this principle much more strongly than any other metal. It was easy to account for Schönbein's error in stating that gold and platina only developed the odour, for he applied but one mode of evolving the principle, namely—by using the substances on which he experimented as positive electrodes in electrolytic fluids; it was therefore clear, that if, as he stated, even gold and platina only produced the odour when clean, it must have been next to an impossibility for the Professor to have evolved it from metals with surfaces more easily oxidable, and therefore in a condition to conceal rather than develope so subtle an element. There was no doubt of its evolution from all the metals employed by the Professor; but there was as little doubt, that immediately on its disengagement, combination ensued with the particles of the film enveloping the ill-cleaned surfaces of the inferior metals, and thus that all evidence of its existence vanished. Mr. De Moleyn, considering the possibility of such an obstruction to the disengagement of the odour, contrived an apparatus by which he applied friction to the surface of the positive electrode, and in every case found that the odour was evolved more or less strongly. Schönbein's opinion that ozone was the electro-negative element of an electrolytic compound existing not only in aqueous fluids, but also in the atmosphere, made it a point of much importance to ascertain if it could be produced in dry air or *in vacuo*. The Professor himself had remarked that "problems of the highest scientific importance would be raised, in case it should appear that ozone could be produced in dry air." Mr. De Moleyn accordingly devised various experiments for the purpose of determining that interesting question, some of which he described in his paper. He stated, that observing the odour to be produced at the points connecting an electro-magnetic machine with the battery, he constructed an apparatus by which magnets were made to revolve within a glass cylinder, which could be exhausted at pleasure, or filled with various gases; by such means he obtained a vacuum, and operated in dry air, collecting the matters evolved over distilled water, and by such modes he clearly proved that ozone could not only be produced in a dry atmosphere, but also in a vacuum-mercurial and common. In several instances where distilled water had been admitted into the exhausted tube containing the odour, there was a much larger portion of the tube unoccupied by the water than calculation gave as the maximum space for the residual air after exhaustion; thus proving that ozone had been concentrated, or reduced to a substantial condition. On opening the tubes the odour was scarcely bearable, and diffused itself quickly, causing the same sulphureous smell as that prevailing in a place struck by lightning. These experiments, varied and frequently repeated with similar results, led Mr. De Moleyn to the conclusion, which he hoped would also be entertained by the Section, that the ozone of Schönbein—which he proposed, for good reasons which formed the subject of a future paper, to name Electrogen—must be admitted into the list of supposed elements; that it was not, as developed by Schönbein and himself, an union of an electrolytic compound whose nature was unknown; and that probably it existed in combination in various forms of matter, which at present are considered, but which, in reality, are not elementary. Mr. De Moleyn added, that he was still prosecuting these experiments, and hoped shortly to add considerably to the proofs already adduced. He was quite sure that the results already obtained would be followed, when in abler hands than his, by a succession of brilliant discoveries, proving the opinion at present entertained concerning elementary substances to be sadly at variance with that beautiful simplicity which throughout the universe formed, and still forms, the ground-work of the operations of the great Author of our existence.

Mr. De Moleyn next gave notice of the discovery of a voltaic combination of extraordinary energy. To this combination he had given the designation of the Calorific Sustaining Battery, from its amazing calorimotive powers. He stated that the energy of the combination was such, that with three pairs of metals, exposing no more than six square inches of surface, the battery will liberate five cubic inches of mixed gases per minute; heat to a bright red, six inches of platinum wire, 1-50th of an inch in diameter; and charge electro-magnets proportionally. Mr. De Moleyn added, that the combinations were such that there was no counteraction, so that he had the sum of the affinities instead of their difference. There was also the additional advantage that there were no unpleasant fumes, and that the battery could be made to sustain its power for any period required.

Mr. De Moleyn's papers were received with much satisfaction by the Section.

Professor Daubeny remarked, that Mr. De Moleyn's communication was of great importance. It appeared to him that the next step to take, would be that of investigating the chemical action of the principle, and he would suggest to Mr. De Moleyn to direct his future inquiries to its combinations with different substances.

SECTION C.—*Geology and Physical Geography.*
Papers and Communications.

1. Mr. Bowman, 'On the Upper Silurian Rocks of Denbighshire.'
2. Mr. De Milne's 'Report of Committee on Earthquakes in Scotland.'
3. Professor Phillips, 'On the Occurrence of Species of Entromostraca in Palæozoic Strata.'
4. Mr. W. Walker, 'On Submarine Geological Changes, produced by Pholas at Plymouth.'

The business of this Section was commenced by an able exposition of the strata of the upper Silurian system in Denbighshire, by Mr. Bowman (and here and throughout the proceedings of this Section, we feel that we can safely condense the matter, which often merely repeats what we have stated in our ample reports of the Royal Geological Society of London throughout the previous season). Mr. Bowman described the Silurian rocks as a group running through the eastern and northern boundary of Wales, bearing a general resemblance, in their formation, to the old red sandstone of Herefordshire, which was the more remarkable, inasmuch as that rock did not exist in Wales. The Silurian rocks contained, also, some of the most characteristic fossils of the old red sandstone. He had classed them in two divisions, the upper and lower, and exhibited their general structure in the following table:—

Upper Silurian Rocks of Denbighshire.
Upper Division.

1, 2, 3. Thin, red, and green sandstones, with upper Silurian fossils.
4. Compact argillaceous, with upper sandstone fossils.
5. Unfossiliferous shale.

Lower Division.

1. Thin, parallel, hardened schists; no cleavage or fossils.
2. Parallel, grey, banded shales.
3. Coarse, dark flags and slates, slightly calcareous, coarse cleavage: orthoceras, graptalites.

Upper Division	1100 feet.
Lower Do.	3700 do.
In all	4800 feet.

Mr. B. differed in some points from Mr. Murchison and Professor Sedgwick, whose special domain this Silurian group may be considered to be. Referring to many localities, he proceeded to describe in detail the characteristics where the various appearances he adduced in support of his opinions might be perceived. He considered that the difference between the upper and lower series of the Silurian rocks arose from the lower members having been altered by contact with volcanic matter, the vestiges and indications of volcanic action being perceptible to a considerable extent. The contortions found in the strata of these rocks he also ascribed to volcanic action; and mentioned the most striking instances of disruptions which had attracted his observation. He then brought before the attention of the meeting a comparison of the upper Silurian rocks with those described by Mr. Murchison. The difference was chiefly the superior hardness of the upper formation, in comparison with the lower, which, in the border counties, was of a softer nature, and found in thicker beds; while the stone was invariably found to acquire, by exposure, a dull, ashy colour; so much so, that in Shropshire they were called mud-stones. They were also, in the lower part of the series, altogether destitute of cleavage. Though there was abundant evidence of the identity of the Shropshire and Denbighshire strata, yet it was interesting to investigate the changes that were found in their appearances. If these differences were so great in one district, what could be expected from rocks of the same general character in different countries? These differences ought not to shake their faith in geological researches, but they ought to demonstrate more forcibly the importance of fossils.

The chairman (Mr. Delabeche) adverted to the general principles unfolded in this paper as likely to lead to beneficial discussion and results.

Professor Phillips objected to the foundation of any theory of the geological age of rocks upon the fossil and organic remains which they contained; but highly praised Mr. Bowman for the close observation he had displayed, and on the value of such local expositions as he had produced. With regard to the distribution of those mineral masses which had been distinguished as the upper and lower Silurian rocks, that distinction, if it rested on their mineral composition, it was very difficult, if not impossible, to discriminate when the circumstances of their position could not be clearly seen; yet the mineral characteristics of a series of rocks were of great value, if the deposits had taken place in certain basins, in which they must have been deposited according to certain laws. In the paper that had been read some of those circumstances were remarkably deficient,—where for instance was the limestone? The fact of the absence of cleavage was also one of a very doubtful character, whence to imply the age of rocks. With regard to the value of organic remains in determining the age of rocks, they must take care, in laying hold of this Ariadnean thread, that they had hold of the right one. The study of organic remains required much caution and was to be followed out with care, in order to avoid erroneous inferences and uncertain conclusions. They had never yet had any correct account of the organic remains and their distribution in strata, from the bottom upward and horizontally. Though a great share of attention had been bestowed upon them, yet they presented a very extensive problem to the geologist. He mentioned several fossils, which he stated occurred in rocks of different kinds, and evidently had a wide distribution.

Professor Sedgwick gave the author a bit of jobation for encroaching, as we have hinted, on his territory; but, after all, there was so little real difference of opinion that we may dismiss the conversation.

Mr. Hammett read Mr. Milne's Report 'On the Comrie Earthquakes in Perthshire,' and referred to a committee last year.

It stated that the pendulum in the instruments used for the observations had twice marked the index paper, and in both cases the oscillation was towards the west. From this he inferred that the motion of the earth was from a centre towards the east; and stated that the displacement in the first shock amounted to half an inch, and in the second to somewhat less. These were horizontal movements; but there were probably also vertical movements, which, though evident to the sense of many of the inhabitants round about, were not susceptible of being recorded by the instruments employed. These instruments were, indeed, otherwise imperfect; as they only registered three shocks out of twenty-seven, which were distinctly felt. More sensitive machinery was recommended in the pursuit of the investigation of this interesting inquiry, which is also being carried on at Turin.

The Marquess of Northampton offered some remarks on the instruments, and advised the opening of correspondence with persons engaged in similar experiments in other countries, and ascertaining what means were best suited to attain accurate registries.

Professor Sedgwick concurred in these opinions; and Dr. Buckland lightened the discussion, by stating that in certain places liable to earthquakes, their extent was measured by bowls of treacle (the inclination of the treacle in the bowl shewing the quantum of shock), and elsewhere (by a watchmaker in Scotland) by placing a clock against each of the four walls of an apartment, and marking the centre of the disk of the pendulum with chalk; when the shock took place, the derangement caused the pendulum to strike against the back and front of the clock-case, and of course a mark would be left indicative of the phenomenon, though not of its amount.

A pleasant conversation ensued, in which the Marquess of Northampton and others participated; but the chief incidental facts stated were by the Chairman, who quoted an opinion of Mr. Babbage, that the degree to which the shock of an earthquake was felt depended greatly on the strata or description of rock on which the observer was standing; and by Dr. Buckland, who stated that Chichester was more liable to earthquakes than any other place in the kingdom, in consequence of its being on the continuation of the Isle of Wight formation.

Professor Phillips gave an interesting description of the bivalvular crustacea found in fresh-water limestone, and the minute animals of the crustacea species found in water both fresh and salt. It was followed by some remarks on the same subject by Dr. Buckland, who mentioned the fact of one of the varieties of this species being found in the brine-pits of certain salt works, in water ten times salter than that of the ocean. He noticed the error which people generally committed in conversation by using the term "shell-fish," and including in the generic term "fish" the varieties of the crab and lobster, which were crustaceous animals.

Mr. Walker (the harbour-master) then read his very important paper 'On the Deposits of the Sound and Harbour.' It related, also, particularly to the ravages made in the limestone rocks, below the low-water level, by the "shell-fish" (if Dr. Buckland would permit him so to term it) *Saxicava ragusa*, which pierces and drills the most solid piece of rock into holes, till, by the continued ravages of the animal, and the action of the water, the mass

is worn away. He produced specimens of limestone taken up from the Breakwater and other parts of the harbour, which were eaten through in the manner described, the shell remaining fixed in the destructive creature's self-excavated gallery. He stated that the sea-wall of the Dock-yard, which was built of Portland stone, had been perforated and fretted away in all directions; and the cliff at Devil's Point, which was limestone, was completely undermined from the same cause. The tidal stream was more rapid here than in any part of the harbour, and the bottom was thus kept clear of mud. He inferred, therefore, from the greater depth of the water here, and over the limestone, generally, compared with the depth above those kinds of rock which the creature did not appear to attack, that the destruction was imputable to the *Saxicava*. He stated that it was a question of great importance for engineers to consider, whether limestone ought to be employed at all in submarine constructions. With regard to the deposits of the harbour, Mr. Walker stated that the formation of the Breakwater had allowed the deposition of a bed of mud, which had already accumulated; the force of the waves rushing from the open sea into the harbour, and breaking violently against the rocks of the Citadel, formerly swept the bed of the harbour clear; but now a deposit was taking place, and an anchorage was being formed where there was previously only bare rocky bottom. The paper concluded with some further remarks on the share the *Saxicava* was supposed to have in deepening the water over limestone rock.

The Chairman, in inviting discussion, recapitulated the chief points of the paper, pointing out the suggestion of Mr. Walker as another of the instances in which geology was brought to bear on the business of life.

Dr. Buckland remarked on the great results that arose from apparently insignificant causes. He took the animal mentioned in the paper that had just been read as an instance. In some period of time, geologically speaking it mattered not whether two hundred years or two thousand, it appeared that the *Saxicava* would eat up the Breakwater itself. He stated that in one point he differed from Mr. Walker, who had exhibited a piece of limestone procured from a height of eighty-two feet above mean water mark, and which was perforated in the same manner as the specimens taken from under water, and which Mr. Walker had ascribed to the same cause, when the present cliffs were under the sea level. He had met the same perforations in limestone on high land in other places, and ascribed them to the common snail. He pointed out the difference between the perforation of this specimen and that undoubtedly made by the *Saxicava*. He did not think that the former was made by the action of any specific organ, but by the motion of some very slowly acting acid, secreted by the snail. He had found snails in large numbers in these cavities. One locality he mentioned was a high spot about six miles inland from the coast of Boulogne.

Professor Owen stated, as an objection to this theory, that such an acid would probably act on the substance of the shell of the animal as well as on the rock. He referred the perforating powers of the pholas chiefly to the vibratile cilia, invisible to the naked eye, which kept up a constant motion night and day, quite independently of the will of the animal, and which continued as long as it had life. When lodged in the rock, by means thereof a perpetual and strong current of water was continually pouring in and out, and it might be conceived, from the well-known effect of running water on stone, that this constant action might produce the perforation. To this he thought might be added the friction of the shell itself.

The discussion that ensued was joined by the President, by the Rev. Mr. Conybeare, Mr. Phillips, Dr. Moore, and Professor Henslow.

Mr. Delabeche and Professor Phillips took the same view of the agency of snails as Dr. Buckland. The former also, with reference to the submarine perforations of the lithophagi, thought it possible that by means of the animal secretions and excretions, their soluble carbonate of lime was converted into the soluble bicarbonate, which was therefore washed away from the spot underneath the animal, and that, thereupon, the animal sunk deeper and deeper into the solid rock.

Professor Henslow mentioned the curious fact, that pieces of limestone which he had seen, and which had been brought from Barnstaple, where they had formed part of the church tower, presented precisely the same cavities as those which had been attributed by Dr. Buckland to the agency of snails. These, however, there was no doubt were due to the chemical action of spray and marine vapour, for therein had been found quantities of carbonate of soda, one of the results of the consequent double decomposition of the limestone and sea-water.

The general opinion appeared to be against Dr. Buckland's theory with regard to the perforation being produced by the snail, though he supported his argument very strongly.

SECTION D.—*Zoology and Botany.*
Papers and Communications.

1. 'On the Geographical Distribution of the Animals of New Holland,' by J. E. Gray, Esq., British Museum.
2. 'On the Habits of *Cecidomyia tritici* (Wheat Midge) and the Developement of *Uredo*,' by Professor Henslow, of Cambridge.
3. 'On the Zoology of Cornwall,' by Jonathan Couch, Esq.
4. 'On some Species of European Pines,' by Captain Widdrington, R.N.
5. 'On Organic Beings in the Mineral Waters in Scotland,' by Dr. Lankester, of London.

Mr. Gray's paper took a wide and comprehensive view of the animals of Australia and their geographical distribution; and general readers, as well as readers of natural history, are aware of the strange peculiarities and anomalies which exist in many of the creatures of this *newest* world. Into these, however, the writer did not enter, but gave a distinct account of the various genera and species as yet discovered in the country. The mammalia amounted to ninety-four, and belonged to thirty-three genera; seventy being marsupial; two feræ, or carnivorous; eleven belonging to the mouse tribe. Of the above, fifty-eight species inhabit New South Wales; twelve, South Australia; nineteen, Western Australia; five, the north-west coast; two, only, the north coast; twenty-one, Van Diemen's Land; and one, only (supposed to be derived from New Zealand), Norfolk Island. The paper was principally founded on the species contained at the British Museum, and described by Mr. Gould.

Professor Henslow, whose investigation of matters connected with agriculture, its processes and products, is of such vast practical utility and value, invited the co-operation of members of the Section in his attempts at perfecting the natural history of the wheat midge (*Cecidomyia tritici*). In endeavouring to ascertain the nature of this injurious insect, in order to find a remedy for the evils of its propagation and presence as a disease in grain,* he stated that, notwithstanding all his efforts, he had not been able to breed a single fly from many hundred of the larvæ which he had procured from barns during the winter months, by sifting the chaff immediately after the corn had been dressed; and that Mr. Curtis had been equally unsuccessful. The inquiry to which he was anxious to direct the attention of naturalists was, whether the flies—which appear in myriads during the first week of June, and then deposit their eggs in the ears of wheat—have proceeded from those larvæ which had entered the soil and lain dormant there during winter, or from other larvæ which are found in great profusion housed in the ears of the wheat? It was of considerable importance to ascertain this point correctly, as the possibility of materially checking the pest would depend upon the result.

[It is in the soil, from which, and from manures, we are of opinion, most of our perennial injuries to the produce of the earth are derived; the larvæ must be assailed there: if in the garnered grain, the operation must, of course, be altogether different.—*Ed. L.G.*]

Professor Henslow then exhibited specimens of mildew (*Puccinia graminis*) in connexion with rust (*Uredo rubigo*), and also of Aregma mucronata with Uredo rosæ, and Phragmidium obtusum with Uredo potentillæ, for the purpose of illustrating and confirming an opinion he had expressed in the "Journal of the Royal Agricultural Society," that the uredines described by botanists were probably only incomplete states of fungi, which, when perfectly developed, were classed under Puccinia or other allied genera.

Mr. Crouch's Report on the Zoology embraced the chief classes of animals, and led to observations upon temperature, in which he stated that severe winters occurred in every six or eight years. He illustrated the latter subject by the appearance of the bat, which might be seen throughout an ordinary season of the whole year, but retreated from view when the thermometers fell below 40°. Other animal proofs of the fineness of the climate were adduced, and the fauna of Cornwall, augmented by the additions of the writer, was stated at 230 species of birds, and 167 of fishes.

The next subject was one of great practical utility, and of much interest to landowners and farmers in certain localities, exposed to sea-breezes which affect the growth of wood, as here on the coast of Devonshire.

Captain Widdrington, in a recent tour in Germany, made some observations on the pine, which has enabled him to add several species to those of which he treated at the Newcastle Meeting. On the Alpine confines between Austria and Bavaria he had found two, the *Pinus Austriaca* and the *Pinus pumilis*, which grew to the very summit of these mountains, and which were well calculated for plantations in this country. The former was a good timber, and the latter would form a fine cover for game. In the course of remarks made on this short communication, it was mentioned that neither the Scotch fir nor the pinaster withstood the prevalent south-west winds of Devon; and that, consequently, the introduction of these novelties would be of much value to the county, and to other districts similarly situated.

The last paper of the day was Dr. Lankester's, 'On Organic Beings in Mineral Waters

* Agriculturists know that it is very dissimilar from the rusts, red gum or yellow, caused by various fungi, and which, in wet seasons, destroy so much corn.—*Ed. L.G.*

in Scotland and the North of England;' and here, as in other cases, it was apparent how much the most minute inquiries of science might resolve themselves into useful every-day purposes. Health and conveniency cannot be dissociated from the condition of mineral and common waters.

At St. Bernard's Well, the popular spring near Edinburgh, Dr. L. found *Confervæ niviæ*, which indicated the presence of sulphuretted hydrogen, but no animalcules or infusoriæ. At Moffat, the same confervæ, and the gelatinous matter of which the French chemists make so much under the name of *glarin*, and which he, Dr. L., considered to be the decomposition of *C. niviæ*, or of some other organic being the inhabitant of these sulphureous springs. Lower down in a burn, into which the water ran, he discovered myriads of globular and eel-shaped bodies from the thousandth to the ten-thousandth part of an inch in length; which he had brought to land in bottles and submitted to analysis. They shewed great activity, and a pink colour prevailed in the water (as we understood). [Might not the solar microscope be advantageously employed more than it has been in such researches?—*Ed. L. G.*] At Harrogate they were larger, and agreed with Ehrenberg's monass. Gilsland abounded with *Confervæ niviæ;* and there were patches of green floating about, but too much decomposed to allow of its nature being determined. In the chalybeate the *Gallionella ferruginea* prevailed. These inquiries were interesting, inasmuch as they went to ascertain the laws by which organised beings were governed.

Dr. Daubeny, whose experience had been appealed to, stated that all the glarin of the waters in the Pyrenees was composed from organised beings. Mr. Shuttleworth of Berne had shewn that red snow proceeded from infusoriæ, and not from confervæ, as had been supposed. It was clear that the *Conf. niviæ* was connected with hydrogen gas, and was congenial to that which destroyed higher animals and vegetable life.

Reference was also made to Professor Daniell's experiments on the waters of the Quorra; and it was suggested that the present investigation might conduce to a more perfect understanding of the causes of the fatal miasma on these African shores and rivers.

The glarin exists in the vapours of Vesuvius.

Dr. Lankester added, that the confervæ in a single night threw out multitudes of fibres, and he also considered the glarin to be its decomposition.

SECTION E.—*Medical Science.*

Papers and Communications.—Nil.

In connexion with the Natural History Section, we may copy the following:—

Suggestions for Experiments on the Conservation of Vegetative Powers in Seeds, which appear to us to convey much curious information, and to be *generally* deserving of attention.

These experiments are intended to determine the following questions:—

1. What is the longest period during which the seeds of any plant under any circumstances can retain their vegetative powers?

2. What is the extent of this period in each of the natural orders, genera, and species of plants; and how far is it a distinctive character of such groups?

3. How far is the extent of this period dependent on the apparent characters of the seed, such as size, hardness of covering, hardness of internal substance, oiliness, mucilage, &c.?

4. What are the circumstances of situation, temperature, dryness, seclusion from the atmosphere, &c. most favourable to the preservation of seeds?

To answer these questions satisfactorily will require the accumulation of a large mass of facts; and although there are many difficulties in the way of such an investigation, and many years may elapse before it can be brought to maturity, yet it is desirable that the British Association should commence the collection of materials for the purpose. It is proposed, then, to invite botanists and others to undertake the following series of experiments, and to communicate the results to the British Association. These experiments are either retrospective or prospective.

A. Retrospective Experiments.

1. By collecting samples of ancient soils from situations where vegetation cannot now take place, and by exposing these soils to air, light, warmth, and moisture, to ascertain whether any, and if any, what species of plants spontaneously vegetate in them.

N.B. Care must of course be taken that no seeds obtain admittance into these soils from external sources, such as the air or water introduced to promote vegetation.

These ancient soils are either natural or artificial deposits. The natural deposits belong either to past geological periods or to the recent period.

a. The deposits of past periods are either secondary or tertiary.

N.B. There seems every reason to believe that the age even of the latest of these deposits is far beyond the maximum period through which vegetative powers can be preserved; yet as many accounts are recorded of seeds vegetating spontaneously in such soils, it would be well to set these statements at rest by actual experiment.

In such experiments state the formation, and describe the geological phenomena of the locality, together with the depth from the present surface at which the soil was obtained.

b. Natural deposits of the recent period may be classed as follows:—Alluvions of rivers; tidal warp land; shell marl; peat; surface-soil buried by landslips; ditto, ditto by volcanic eruptions.

In these cases state the nature of the soil, the depth from the surface, &c.; and especially endeavour to obtain an approximate date to each specimen of soil, by comparing its depth from the surface with the present rate of deposition, or by consulting historical records. It would be well to submit to experiment a series of samples of soil taken from successive depths at the same locality.

c. Artificial deposits are as follows:—Ancient tumuli; ancient encampments; the soil beneath the foundation of buildings; the soil with which graves, wells, mines, or other excavations, have been filled up; ridges of arable land, &c. In these cases state, as before, the depth from the surface, and ascertain from historical sources the approximate age of the deposit.

2. By trying experiments on actual seeds which exist in artificial repositories. These are,—Seeds in old herbaria and botanical museums. Seeds obtained from mummies, funereal urns, at Pompeii, Herculaneum, &c. Dated samples of old seeds from nurserymen and seedsmen. In these cases, state the circumstances in which the seeds have been preserved, and their date as nearly as it can be ascertained.

B. Prospective Experiments.

In this department of the inquiry, it is proposed to form deposits of various kinds of seeds under different conditions, and to place a portion of them at successive periods under circumstances calculated to excite the process of vegetation. In the case of certain species or families of plants, it would perhaps require many centuries to determine the limit of their vegetative powers; yet it is probable that a very few years would suffice to fix the maximum duration of the greater number, and that many interesting results might thus be obtained even by the present generation of botanists. It is proposed, then, to form a collection of the seeds of a great variety of plants, (including, wherever it is possible, at least one species of every genus,) and to pack them up (carefully labelled) either alone, or mixed with various materials, as sand, sawdust, melted wax or tallow, clay, garden mould, &c., in various vessels, as glass bottles, porous earthern jars, wooden boxes, metal cases, &c., placed in various situations, as under-ground, in cellars, dry apartments, &c. At certain intervals increasing in extent,—say at first every two years, then every five, every ten, and, at the lapse of a century, every twenty years, a small number (say twenty) of each kind of seed, from each combination of circumstances, to be taken out and sown in an appropriate soil and temperature, and an exact register kept of the number of seeds which vegetate compared with those which fail. Should it appear desirable for this project to be carried out by the British Association, they might most effectually accomplish it by committing a collection of seeds, formed on the above plan, to some qualified person, whose duty it should be, in consideration of a small annual stipend, to take charge of them, and at stated periods to select portions for experiment, keeping an accurate register of the results. In this manner it is believed, that in regard to the large majority of plants, the limit of their vegetative durability would be determined in a very few years, and that a large mass of vulgar errors on this subject, which now pass current for facts, would be cancelled and exploded.

N.B. The most effectual way of exciting vegetation in seeds of great antiquity is to sow them in a hot-bed, under glass, and in a light soil moderately watered.

SECTION F.—*Statistics.*

Papers and Communications.

1. H. Woollcombe, 'On the Statistics of Plymouth, Stonehouse, and Devonport.

2. Dr. Holland, 'On the Vital Statistics of Sheffield.'

The business of this Section commenced very properly with a paper of much local interest. Mr. Woollcombe, after some general preliminary remarks on the visit of the Association, entered upon the immediate subject of his communication. The oldest of the towns, Plymouth, had no great antiquity to boast of, while Devonport and Stonehouse were of still more recent origin. The increase of population and buildings could not be attributed to commerce or manufactures, but to the excellence of the harbours, the numerous government establishments, and to the vast sums annually expended in their support. There was no trace of any Roman settlement in the port, though British and Roman coins had recently been dug up at Mount Batten; they were not aware of the existence of any village there during the Anglo-Saxon era, and the place was described in Doomsday Book by the

name of Sutton, a mere hamlet containing a few enclosures, inhabited by free inhabitants and some serfs and borderers, holding in demesne of the king. In the reign of Henry I. the manor of Sutton existed, the crown having granted it to the Valletort family, a Norman race, and the manor was ever after distinguished by the name of that family, to distinguish it from a manor held by the monastery of Plympton, and called Sutton Prior. Under this fraternity the town seemed to have arisen; they erected the first church, obtained the grant of a market, instituted a civil government by means of a portreeve, bailiffs, and constables, and held a court leet, at which offences were tried and punished. As a naval port, Plymouth was first mentioned in the reign of Edward I., when a fleet of 325 vessels assembled here under the command of Edward, Earl of Lancaster; and hence it might be inferred that a considerable town had arisen, especially as in the twenty-sixth year of this reign it was called on to send members to parliament, the returns being made in the name of the borough of Sutton; but the name of Plymouth was used in the reign of Edward I. in a writ from the king, and in the time of Edward II. the same name was in frequent use. In this latter reign it seemed to have increased considerably, for it was deemed worthy of an attack by the French, who burnt a great portion of it; but the calamity occasioned no permanent injury, for nine years subsequently, the port of Plymouth (probably including Millbrook, Saltash, &c.) provided 26 ships and 613 seamen for the king's service, with which his majesty blockaded Calais. In 1354, too, Edward the Black Prince sailed with a large fleet for France, and landed here in 1355 with John, King of France, his prisoner, after the battle of Poictiers. Many ecclesiastical communities of the Augustine, Dominican, and Cisterian orders, had at this time built houses here; and in 1377, the last year of the reign of Edward III., the return of population, made for the purpose of imposing a poll-tax, was 7000; and at that time there were only three towns in England containing a larger population, viz. London, York, and Bristol. In 1414, during the reign of Henry V., however, the towns did not send members to Parliament, though Plympton, Tavistock, Totness, &c. did, thus shewing that a great change had taken place, but whether it arose from another and very destructive French invasion which occurred in the reign of Henry IV., or from depopulation by sickness, did not appear. Plymouth was incorporated by Henry in 1439, and from that time to the present day, it had regularly returned members to parliament. In 1501, the corporation appointed a master to teach grammar to children, natives of the town; the first master was Thomas Brooke, his salary was ten pounds a-year, with lodging in the chapel-house, and the chapel was converted into a school. In the next year the suppression of monasteries took place, and the prior of Plympton was removed from his office and jurisdiction; but this probably was most acceptable to the corporation and inhabitants, many disputes having arisen between them. Many wealthy merchants resided in the borough at this time, among whom was the father of the celebrated Sir John and Sir William Hawkins. In the reign of Queen Elizabeth, Plymouth was the rendezvous for the fleet collected to oppose the Spanish invasion, and many voyages of discovery were fitted out, under Drake, Oxenham, Parker, and Cox. Here, also, probably commenced the abominable slave-trade; for in 1577, vessels were fitted out in the port, to trade from the coast of Guinea to the West Indies, then recently captured from the Spaniards. At this time the representatives of the borough in Parliament were men eminent for their public services, as Sir John Hawkins, Sir Francis Drake, Sir Humphry Gilbert, Sir Walter Raleigh, Sir Richard Hawkins, Thomas Cavendish, Esq., Sir Richard Grenville, many of whom were members of the corporation. At the time of the expected arrival of the Spanish Armada, Lord Howard of Effingham, and many noblemen and gentlemen, were assembled here. In this and the succeeding reign fleets were equipped here for founding settlements in America; whereby the talent and industry of the inhabitants must have been greatly excited. Raleigh was engaged in transporting inhabitants to Virginia; the Drakes, Raleighs, Gilberts, and others, founded settlements in New England, and named a place there New Plymouth; which, with other settlements, were the work of a chartered company called the "Plymouth Company." The comfort and importance of the town was much increased by Sir Francis Drake, who, about this time, at the expense of the corporation, brought the water into the town, from Dartmoor, by a circuitous channel of twenty-five miles. In 1630, an institution, denominated "The Poor Portion," was raised to provide work for the industrious, to reform the idle, and to shelter the aged and the sick; an institution which marked the growing attention of the rich to the wants of the poor. In 1625, also, an institution had been erected for the reception of orphans, who were clothed, lodged, educated, and apprenticed. In 1640, the town was divided into two parishes, and steps taken for the erection of a second church — the present Charles Church; but the political troubles of that time put an end to all these measures. The contest between Charles I. and his Parliament agitated Plymouth; the town took the side of the Parliament — the gentry of the king; and the former successfully resisted several attacks made by the king's army on the place. One of the results of this warfare was the conversion of St. Nicholas's Island into a state prison, where, after the Restoration, many regicides were confined; and among them the celebrated Colonel Lilborne and Major-General Lambert, the latter of whom terminated his days there, after being imprisoned fifteen years. In the reign of Charles II. the Citadel of Plymouth was erected, and its progress occasioned two visits from King Charles and his brother, the Duke of York. In 1690, the reign of William III., the navy estimates laid before Parliament contained a charge for building a dock at Plymouth, and, in the following year, the dock in Hamoaze was begun. Indeed, it must appear strange that a harbour so peculiarly fitted for a naval arsenal had so long remained unnoticed by the government, especially as its natural advantages had been pointed out in a pamphlet by Sir Walter Rashleigh, nearly a century before. That statesman observed that it was very possible for the enemies of the country, having a superior fleet in the Channel, to blockade the mouth of the Thames, and completely impound all our fleet, then stationed at the principal arsenals in that river, viz. London, Deptford, Woolwich, and Chatham; and this suggestion was afterwards fatally realised in the reign of Charles II., when the Dutch fleet, under Von Tromp, insulted our shores, whilst the fleet remained triumphant at Chatham. In 1696 that most memorable work, the Eddystone Lighthouse, was commenced; it had been for many years a desideratum to erect a beacon on the Eddystone rocks, a ridge at the entrance of the port, which should not only warn the mariner from his danger, but also guide him in darkness and amidst the war of the elements into safety. Mr. Winstanley, a gentleman of Essex, first attempted the important work, and in four years constructed an edifice which answered every purpose while it endured, which was but for a limited period; for, in 1703, the building was assailed by a storm, which has ever since been emphatically styled "the great storm;" and in it, either by the electric fluid or the resistless sea, or both, the architect and his work were swept from their position, and in the succeeding calm the rocks shewed themselves again in their pristine nakedness. In 1707 Mr. Rudyard of London erected another edifice on these rocks; but, having employed a large quantity of timber in the erection of the building, its roof, where the light was placed, caught fire, and the fabric was totally destroyed, after existing forty-eight years. Soon after Smeaton erected a third building, which was so constructed that the force of the winds and the waves were evaded and not resisted, and, by the aid of Franklin, the electric fluid was conveyed to the earth. Such were the benefits resulting from the cultivation of science; and Smeaton, unrewarded by his government or his countrymen, undistinguished by any public monument, had himself raised one to his memory, surpassing in probable durability all that wealth and titles could have bestowed. From the period of the foundation of the dockyard, Devonport, formerly known as Plymouth Dock, must date its rise; and to the large sums expended in pay, &c., might be ascribed the increase of Plymouth, Stoke, and Stonehouse, in wealth and population. The Dockyard necessarily drew around it, in the lapse of a century and a half, a victualling office, gunwharf, naval hospital, powder magazines, royal marine barracks, and barracks for the troops in the garrison. In 1812, the Plymouth Breakwater was commenced, the success of which in forming a safe roadstead in the Sound was complete; Mr. Rennie designed the work, and the execution of it was intrusted to Mr. Whitby, an able nautical man. It was apprehended at one time, that the prosperity of the port was dependent on the continuation of war, but the experience of twenty-five years of peace denied the position. In proof of this, the population of Plymouth had increased since the termination of the war in 1816, from 20,000 to 36,000, while the dwelling-houses were considerably superior; the charitable institutions more numerous; scientific institutions had been formed; roads improved and lighted, during the time of peace, all of which were indicative of general prosperity. And though Devonport and Stonehouse may be more dependent than Plymouth on the expenditure of government, yet it must be remembered that they have public institutions and charities to appeal to, which were indicative of increasing wealth, and these towns also shewed in their public buildings as well as in their domestic architecture a great increase of taste and durability, and in the latter of elegance and comfort. Plymouth as a trading port stood high among the secondary ports of the kingdom; so large a population requiring a large importation of necessary articles, such as timber, corn, coals, and its custom dues were increased in amount by the government paying the duties on timber and supplies for the Dockyard and other establish-

ments. There was but little foreign trade, consisting in the importation of sugar from the West Indies, and timber from Canada and the Baltic, the great impediment to its extension being the deficiency of exports. Devon ceased to be a manufacturing county by the cheapened cost of production arising from the use of machinery in the north of England. There were no ironfoundries for foreign supply, and the minerals, granite, limestone, slate, marble, china, clay, fish, were not of sufficient value to constitute a balance to the import, the duties paid on which last year were 135,930*l.* In manufactures there was little beyond ship-building. Plymouth, however, had not been deficient in the production of eminent men in science, there were Huxham, Dr. Mudge, General Mudge; in literature, Musgrave, Bidlake; in painting, Sir Joshua Reynolds, Northcote, Eastlake, Haydon, and others. But in education, a school of superior pretensions to those now existing was required for the upper classes, and there was also a great deficiency both of comfort and capacity in the provision for the poor classes. There was also a lamentable want of accommodation for the poor in the churches of the establishment. The population of the three towns was now about 80,057 persons, and, therefore, constituted the tenth place in the kingdom, being exceeded only by London, Glasgow, Manchester, Liverpool, Edinburgh, Halifax, Birmingham, Leeds, Bristol, and Sheffield. There were no signs of decay in the political constitution of the towns, the government establishment being more splendid externally, and as efficient internally; commerce and manufactures were increasing, the communications with other parts was greatly facilitated by steam, the roads and hedges were improving, and though the formation of a railroad toward the metropolis was retarded by the natural difficulties of the country, the want of capital and a lack of the adventurous spirit which characterised other parts of the empire; yet, doubtless, the visit of the Association would stimulate the population to exertion, and the government to foster a port so intimately connected with the welfare of the nation.

In answer to a question Mr. Woollcombe stated that the amount of population in 1377 (7000), he had ascertained from a return now in the British Museum, which had been made for the purpose of the poll-tax, and hence not likely to be exaggerated.

A desultory conversation ensued on the causes to which the increase of the population in Plymouth, and the decrease in Devonport, might be attributed, but no decided conclusion was arrived at. It was stated by one speaker that the census was taken in a less perfect manner than in 1831, being consigned to too many hands (ten or a dozen) instead of being intrusted to two or three competent persons.

The Rev. R. Luney stated that one circumstance remained to be mentioned which might have caused the decrease of population at Devonport—he meant the peculiar tenure of the land. The tenure of Plymouth was freehold, that of Devonport leasehold, determinable on lives, and many persons who had given up business on realising a competency at Devonport came to Plymouth and built residences. The following tables of government establishments were given in with this paper:—

Her Majesty's Dockyard.

Men employed.	Convicts employed.	Horses.	Present expense per annum.
2389*	496	44	£120,000†

Ordnance—Gun-Wharf.

46	24	..	..

Keyham Point Magazine.

23	..	..	..

Royal Powder Works, St. Budeaux.

13	..	..	..

Royal William Victualling Yard.

143	..	..	10,000

Royal Naval Hospital.

..	..	..	8,765‡

The Breakwater.

210	..	..	15,000

The preceding table gives only a very small part of the expenditure by Government at this part; other claimants are as follows:—

Pensions to officers and their widows; worn-out seamen and marines; sea-wages to sailors, marines, and their families, about 400 of whom attend monthly	£120,000
To about 40,000 wives, &c. of sailors and marines, in monthly payments	45,000
To seamen in ships paid at this port	215,000
	£330,000

This expenditure is, of course, on a peace establishment. In the year 1814, when Great Britain had 900 ships in commission, it amounted at our port to 970,000*l.* in one year.

TABLE OF POPULATION.

Plymouth.		Parish of St. Andrew's.		
1801.	1811.	1821.	1831.	1841.
9,727	12,339	12,206	18,884	
		Charles.		
7,313	8,464	9,385	12,196	
16,040	20,803	21,591	31,080	36,523
Stoke Damerel, including Devonport, &c.				
1801.	1811.	1821.	1831.	1841.
23,747	30,083	33,578	34,883	33,822§
		Stonehouse.		
3,407	5,175	6,043	9,571	9,712
Plymouth, Devonport, Stonehouse, &c.				
1801.	1811.	1821.	1831.	1841.
43,454	56,060	61,212	75,534	80,057‖

[Notice of Dr. Holland's paper must be deferred.]

SECTION G.—*Mechanical Science. Papers and Communications.*

1. Mr. Enys, 'On the Connexion which exists between Improvements in Pit-work, and the Duty of Steam-Engines in Cornwall.'
2. Dr. Lardner's 'Report on Railway Constants.'

Mr. Russell read a report sent from America by Dr. Lardner, as one of the committee, 'On Railway Constants.' We had heard and understood that Mr. Woods was to draw up another report, being also a member of the committee, but nothing of the kind appeared till the Monday following; so that it will be well to look at them with reference to each other. That now brought forward was very minute, and, though much abridged by the reader, very long and voluminous. The following are parts preserved, in continuation of the preceding paper on the same subject at Birmingham, which created so much difference of opinion and endless discussion, and pointing still to further experiments.

The first point which Dr. Lardner considers is, whether the presence of the engine and tender in front of the train had any effect in rendering the progress of the train less fast than if it were moved forward as by the foremost coach, if the resistance of the air was consequently greater. As a corollary to the first question, the second arose as to whether the form of the front of the train had any effect in connexion with the resistance of the air—whether that resistance would not be so great, if in form it be pointed like the bow of a ship. These points had been attended to by Mr. Brunel. In order first to decide this, an engine was reduced as nearly as possible to the power of the ordinary carriages by detaching the pistons, &c., and any working part calculated to create any mechanical assistance different from that of the ordinary carriage. The engine and tender were placed on an inclined plane on the Liverpool and Manchester Railway, and allowed to pass from their own gravity, the space being divided into distances of 110 yards. Two coaches were also allowed to descend in the same manner, and the general results were, the distance passed over by one, 4710 yards, and that by the other, 4577 yards, being a difference of 133 yards only. The weight of the engine and tender was 11·39 tons, and of the coaches, 11·33 tons, a difference between both of only nine. The time occupied by one in the descent was four minutes and twenty-nine seconds, and that by the other, four minutes and twenty-four seconds. Thus the difference in the run amounted to only 133 yards, in a distance little short of three miles, with a difference in time only of a few seconds,—a difference which might reasonably be supposed to arise in experiments made at different times, even with the same coaches. An experiment was also made with an engine and tender and railway coaches, the object being to discover whether square end coaches, or the ordinary locomotive engine, from its form, suffered the greater resistance of air. The engine chosen was called the Fury, which, with its tender, was put against two coaches, plus a train of four coaches, the one weighing 27·45 tons, and the other 27·45 tons. The distance ran by one was 5068 yards, that by the other, 4850 yards, being a difference of 218 yards, and rather in favour of the six coaches. An experiment was also made with reference to the form of the coach, whether the resistance would be less if the coach were shaped like a boat. The sharp end of the coach on this occasion consisted of two boards united in front at a vortex angle of 5·6, and at the base corresponding with the width of the engine. The ordinary shaped engine and the pointed one both moved down the inclined plane, the result being as nearly as possible similar. To remove all doubts, another experiment was tried on the Grand Junction Railway, when the general result was only a difference of fifty yards in a distance of eight miles. In order to find the result of the magnitude of the front carriage being independent of the magnitude of the whole train, an experiment was made, when a kind of wings was formed, extending from the front coach; this, however, did not produce any very considerable effect,—an effect certainly not in proportion to the increase of the frontage of the train. Now, as it was thought that as in water each of a number of boats experienced a resistance of that fluid, which would not be so experienced were they to be all entirely connected with each other, the same principle might apply with reference to the train; an experiment was accordingly made, the coaches were connected by canvass passing along the space between them, forming the train into a single unbroken column. There were eight coaches so connected, and the general result of the experiment proved that the open spaces had no sensible effect with regard to the resistance. But, whereas the size of the front coach was productive of no

* The workmen are paid every Friday, in gold and silver, about 2300*l.*

† Wages, only,—does not include cost of timber, iron, and stores of every description; the cost of which must be very large, as by a rough calculation a man-of-war is estimated to cost the country 1000*l.* a gun: but this latter expenditure is, of course, not local, or at least in a small degree only.

‡ In war it would amount to about 30,000*l.*

§ This amount may be incorrect, as the official numbers have not yet been announced.

‖ This is incorrect, if the previous number of the Devonport population is so, as that forms an integral part of the 80,057.

considerable difference, a change in the entire bulk or volume of the whole train would be productive of very great difference. Another experiment, made with eight coaches, also clearly shewed that the first carriage, having cleared a passage through the air, did not consequently lessen the resistance against the others. Dr. Lardner, in the report, points out why this is the case, and gives a satisfactory reason why the resistance of the air is kept up. The wheels of the carriages, the Doctor states, produce vortices of air, and operate as fanners or blowers. In a train of eight carriages there are thirty-two eight-feet wheels, each revolving four or five times in a second; these, therefore, operating to such an extent as blowers or fanners, create extensive currents of air which move by the side of the trains; and these successive currents explain the resistance of the air alluded to. But it was evident that the resistance depended upon the weight of the train and the bulk of the coaches. The report then alluded to the doctrine of gradients, which some engineers oppose, and which others firmly adhered to, for while some are favourable to rapid ascents and descents, others are advocates only of a dead level. Of one system the Grand Junction Railway is a specimen, and the Great Western Railway is a specimen of the other. Dr. Lardner supports the system of ascent and descent. On an experiment being performed, as we understood, from Liverpool to Manchester, the following were the results:—

At a rate of one in	Ascent.	Descent.	Mean of the two.
177	22·25	41·32	31·78
265	24·67	39·13	32·00
400	26·86	36·75	31·16

Dr. Lardner proposes to prove that the descent and ascent nearly balance each other, and that the advantage of a dead level, as compared with a moderate gradience, is nothing. The report concluded by stating, in opposition to opinions which had been entertained to the contrary, that resistance was not independent of speed, the degree of resistance being in proportion to the square of the velocity.

The President remarked, that the report just read was one containing the result of a series of experiments made by Dr. Lardner, at the request of the British Association, whose experience had not arrived at the point to which it had since attained with respect to railroads. The subject would be taken up on a future occasion, when a paper would be read which had much reference to those matters; but he thought enough had been laid before them to enable him to call on several whom he saw before him, who were well acquainted with the subject, and whose observations on any of the various topics alluded to in the report he should be very happy to hear. Before, however, any discussion took place, a vote of thanks was passed by the Section to Mr. Russell, for the luminous way in which he had elucidated the report he had read.

Mr. Grantham was not quite sure that any of the conclusions drawn by the author of the report just read were altogether satisfactory. The speaker also alluded to the subject of sharp curves, and said he thought them no serious impediments to railroad trains.

Captain Tayler said it was certainly a novel thing for a sailor to express opinions with respect to railways. He considered that the action of a fluid was similar to the action of the air. Sailors who had to convey a spar through the water always put the larger end foremost, also there would be a greater pressure of the water. Now, with the air, he considered the pressure the same. It also struck him that the difference alluded to had been caused by the engine rarifying the air, lessening the dense pressure, and creating a vacuum. He believed the best mode for prosecuting experiments which might lead to most satisfactory results had not always been adopted.

Mr. Russell explained the reason why curves had not so great an effect on the speed of the train. However straight the line might be, there was invariably a lateral motion in the train. The question was then naturally suggested, whether any difference in the speed would be occasioned by the curves being in one direction than in both directions? In a curve the train in every oscillation left the outer rail, and was driven back again; this was the reason, in his opinion, why the curves had not such an effect as to the speed of the train as they otherwise might. With reference to the point, he did not think that the experiment could be said to have been successfully performed, unless they had been adjusted to the velocity of the train. Mr. Russell illustrated this by a diagram: they could not expect an experiment to be conclusive, unless the anterior formation of any train be exceedingly acute; yet, having a fair proportion to the velocity, he therefore could not believe that the position was entirely settled—that the former could have no effect on the speed. From such slight modification as that made use of in the experiment, no result of importance could be obtained, and therefore, *à priori*, he did not believe the question settled.

Mr. Rendel stated that the undulatory motion referred to principally arose from the conical form of the wheels. He alluded to the pressure and resistance of the air, and stated that this, on some occasions, made a difference of half-an-hour in the speed of the London and Southampton Railway. If even they got a railroad west of Exeter, it must be effected on those principles which were now becoming fashionable—that of gradients, safely worked, and curves safely passed, and the velocity which would best satisfy those who had an interest in the railway, and please those who travelled, would be twenty-five miles an hour. It must be very gratifying to the local members of the Association to find gentlemen from railway counties favourable to the principle which could best suit this part. After a few words from Mr. Roberts,

Mr. H. Chatfield considered it extraordinary that no allusion had been made to the form of the after part of the carriage. Mr. Chatfield confirmed the justice of the observations of Captain Tayler; and, in allusion to the resistance of the wind, pressed on the attention of the Section that something might be tried in this place, the result of which might be important in connexion with this subject.

The President, as we understood, intimated that the subject was entertained by the Committee.

Mr. Russell believed that the shaping the coaches to a certain length, and pointing them like a boat, would be attended with more expense than appreciable gain. The object, he believed, was to carry the greatest number of passengers with the least possible weight. Railway proprietors required what was advisable in practice rather than what was desirable in theory.

Mr. Roberts said, by a letter received by his firm from Baden, he learned that they had put at the point of the engine some kind of plough, to be used in the winter season, which had eminently succeeded; though the snow had been more than five feet thick it had entirely thrown it aside, and the train had passed along a distance of eleven miles without being delayed more than five minutes.

The President remarked that there would be an opportunity of recurring to those matters to which the Section had alluded; he would therefore call on

Mr. J. S. Enys, who read a very interesting paper 'On the Connexion which exists between Improvements in Pit-Work and the Duty of Steam-Engines of Cornwall.' The paper embraced the result of various experiments on the action of the plunger pole, in reference to the increase of the delivery of water, and the lessening the duties of the steam-engine. The paper included, also, the improvements which, within a comparatively short time, had been made in the pit-works in Cornwall; and the results of the improved machinery were contrasted with what used formerly to be effected. The proper depth for the plunger pole, together with the area for the valve, and the amount of expansion in relative pit-works, were also referred to.

Mr. Hearder, having understood that the principle of the improvements to which Mr. Enys had ably referred, was that of a long stroke with a small cylinder, asked that gentleman if he had had an opportunity of seeing Hearle's Patent Fire Engine, which, with half the labour, threw water to a much greater height than engines according to the old principle?

Mr. Enys replied, that he had been misunderstood by Mr. Hearder; he considered the long stroke with a small cylinder as the means of decreasing the duty of the steam-engine, and consequently rather an objection.

Mr. Rendel alluded to the fact, that captains of mines in Cornwall had not interfered with the pit-works to the same extent that the engineers in Cornwall had been anxious for the improvement in the engines.

POSTSCRIPT.

Wednesday Afternoon.—The last meeting of the General Committee confirmed the minutes of the preceding; and Mr. Hutton moved the re-appointment of the General Secretaries, Treasurer, and Assistant-Secretary, which was agreed to with just compliments to Mr. Murchison, who was absent (but from whose absence much might be expected at next Meeting), and to Colonel Sabine, whose presence had prevented any inconvenience from the absence of his colleague.

On the motion of Colonel Sabine, a considerable addition was made to the new council, the names amounting to thirty-five, of whom above half resided in London, and the others could be corresponded with in the country.

The grants to the various sections were then gone into, and the following sums were voted to Section A:—

A. For Calculation of the Tides at Bristol, to be continued by Mr. Bunt	£20	0	0
Stars in Histoire Celeste	65	0	0
Astronomical Society's Catalogue: Nomenclature of Stars	110	0	0
Lacaille's Stars	105	0	0
Velocity of Waves	30	0	0
Observations on Tides in the Pacific	60	0	0
Applications to Government for Funds to reduce the Five Years Hourly Observations at the expense of the Association, on Barometer, Thermometer, &c., and in case of Failure	250	0	0
(A motion was afterwards made, and agreed to, for the application to Government.)			
Experiments on the Physical Condition of the Atmosphere by Means of *Captive Bal-*			

Brought over	640	0	0
Ions: and Report next Meeting: under the direction of Dr. Robison and Colonel Sabine	250	0	0
Anemometer at Inverness	60	0	0
Sir D. Brewster on Action of Media on Solar Spectra	40	0	0
Simultaneous Magnetic and Meteorological Observations	100	0	0
Hourly Observations at Inverness and Kinguissie	65	0	0
New Experiments on the Force and Velocity of Winds	10	0	0
Whewell's Anemometer	8	0	0
Osler's	25	0	0
(And Reports at next meeting on the last seven subjects.)			
Hourly Observations at the Dockyard	40	0	0
Publication of Scientific Memoirs	83	18	0
Astronomical Observations (Sir J. Herschel)*	75	0	0
Nomenclature of Stars	32	0	6
	£1433	18	6
B. Chemistry and Physiology of Digestion	200	0	0
Experiments on the Effect of Coloured Rays on the Growth of Plants, continued	15	0	0
	£215	0	0
C. Mud in Rivers	20	0	0
Railway Sections before Covered In: Coloured Drawings	150	0	0
Solution of Silica in Water at High Temperature	25	0	0
Registration of Earthquakes in England, Scotland, and Ireland	100	0	0
Temperature of Mines, Ireland	10	0	0
Researches on Belemites (Report next Meeting)	50	0	0
The Printed Publication of Professor Owen's Report on Reptilia (see our preceding General Remarks) an excellent grant	250	0	0
	£605	0	0
D. Professor Owen to report on Fossil Mammalia	200	0	0
Human Races (*much laughter*)	7	11	0
Organic Beings in Mineral Waters	6	0	0
Growth and Vitality of Seeds	10	0	0
Preservation of Animal and Vegetable Substances	6	0	0
Marine Zoology (Dredging)	50	0	0
	£279	11	0
E. None. Apparently fallen out of the circle of Sections.			
F. Inquiries into Vital Statistics	150	0	0
G. Forms of Vessels	150	0	0
Dynamometric Instruments for Steam Engine observations	100	0	0
Applying Constant Indicators to Locomotive Engines on Railways	100	0	0
	£350	0	0
Grand Total	3033	9	6

The Treasurer stated that this amount was by no means imprudent with reference to the funds. Half the grants were never drawn.

The whole amount received at Plymouth was 1280*l.*, including 260*l.* for ladies' tickets. This is the smallest subscription received: 630 tickets had been issued. At Glasgow the amount was more than double.

Colonel Sabine moved the following Reports, not involving grants of money:—

In A. Professor Airy, 'On the Progress of Astronomy in the Present Century.'
Professor Willis, 'Phenomena of Sound.'
Professor Wheatstone, 'Phenomena of Vision.'
Professor Kelland, 'Undulations of Fluids in Elastic Media.'
Professor Bache, 'Meteorology in the United States.'
B. and C. None.
D. Gould, 'On Caprimulgidæ.'
Sir W. Jardine, 'Salmonidæ.'
'The Zoology of New Zealand.'
Sir J. G. Dalgell, 'Habits of Radiata.'
'Molluscs and their Shells.'
E. and F. None.
G. Experiments 'On the Resistance of the Atmosphere to Moving Bodies.'

Most of the above were intrusted to committees or individuals eminent in the several branches of science.

Messrs. Yarrell, L. Horner, and Hutton, were chosen auditors. It was referred to the Council, on the suggestion of Colonel Sykes, that, in future, children under fifteen years of age should be admitted to the Sections at the price of ladies' tickets. Thanks were voted to the President and acknowledged, and the Committee adjourned.

At the final Evening Meeting at Devonport, the audience were eloquently addressed by several of the leading persons, including Professors Buckland, Robison, Sedgwick, and the Marquess of Northampton; and at half-past eleven, the British Association for Plymouth, &c., was at an end.

* Sir John Herschel's Report to the present Meeting arrived too late, in consequence of new post-office regulations: the grant was renewed on this circumstance being formally noticed.

LITERARY AND LEARNED.

VIENNA.

THE projected Academy of Sciences, of which T. Metternich had assured Mrs. Trollope that nothing was more agreeing with his own wishes, is as far from being called into life as it was at the time when T. M. gave this assurance to Mrs. Trollope. The fifth year is lingering on since twelve of the first-rate literary men of Vienna presented, through the Archduke Lewis, to the Emperor a petition to the purpose, that as there were provincial academies at Prague for Bohemia, at Pesth for Hungary, and at Milan and Venice for Lombardy and the Venetian State, a similar scientific establishment might be granted at Vienna for the German provinces of the monarchy. Three of the twelve petitioners (Jaquin, the botanist, Lettrow, the astronomer, and Buckholt, the historian,) are since dead, and the Austrian government, or rather T. M., seems determined that the refusal should outlive the rest of them. The petition after having been dragged on during three years by menial hands of the most subordinate and least qualified offices, has now lain for a year and a half shut up in T. M.'s writing-desk, from which it is not likely to issue before *calendas Græcas*. The French journal "Univers" (however an ultra Catholic one) has lately stated, and, as it seems, not without foundation, some of the reasons which render T. M. so adverse from an academy residing at Vienna. The quiet way in which the petitioners take, however, their long and cruel disappointment, is more than sufficient to prove how ill-founded are T. M.'s affected political fears; the fact is, that he dislikes the idea of an academy at Vienna, as a check put on his favourite scheme to put the whole education into the hands of the Jesuits. If the Austrians were as stirring and troublesome as the Hungarians and Italians, no doubt they would long since have attained their object; but it is a pity that the submissive silence and quietness of the German-Austrian subjects should meet with no other reward than the obstinate delaying of a scientific establishment, similar to what has been granted without difficulty to the Bohemians, Hungarians, and lately to the Italians, at the coronation of Milan, by the revival of the Istituto Lombardo. The archdukes are all favourable to the idea of an academy, and so is C. Holowics, who has raised no objections at all from the financial side; but none take so deep an interest in science as to support the question at the risk of incurring the displeasure of T. M. The effect of this tantalising proceeding of the Austrian government is a general despondency amongst those of the learned men of Vienna who would be the most powerful workmen in the vineyard. The greatest barrenness is to be met with on philological ground, as there are in Austria neither Greek nor Latin scholars, and the forms of classical education, not only of Oxford and Cambridge, but also of the German universities, are nowhere to be found in Austria, which, remaining so far behind not only Prussia but also Bavaria, in science, must hear the famous *a e i o u* spelled in a disagreeable way.—*Austria erit in orbe ultimo.*

SKETCH OF SOCIETY AND BRITISH ASSOCIATION.

Interesting Experiments in Mines.—Independently of the business matters which are brought forward at the meetings of the British Association, there are always a variety of facts floating about in conversation; some of them of as great importance as the principal topics discussed in the Sections, and others of a more playful or jocose nature, a notice of which is desirable in order to afford a more complete idea of the utility, harmony, and good humour, which mark and recommend these assemblages of able and intelligent men.

Among the scientific novelties not brought publicly forward, but reserved, we believe, for the Cornish Polytechnic Meeting at Falmouth, on Monday, report speaks highly of additional and successful experiments made by Mr. Were Fox, whose investigation of the effects of electricity on metallic veins are so much prized by the philosophical and practical world, as throwing a strong light on the formation of mines, and suggesting valuable hints for improving and working them.

Mr. Fox, we understand, has succeeded in making artificial veins by the continuous application of a weak current of electricity! He has mixed clay with metallic substances, and, directing this electric current through the mass, the latter has become deposited in veins at right angles with the electric fluid. This is a striking achievement, and what adds to its interest is, that the same phenomena attend the direction of electricity from one of the natural veins within the mines to another; so that the artificial experiment fully elucidates the operations of nature in this respect. The novelty of the process consists in having so applied the electricity within the mine itself to demonstrate this important theory, and shew by what means the mineral treasures in the bowels of the earth have been produced and are producing!!

The Number of Non-Resident Members, according to the final *census*, amounts to 435, and probably three or four may have arrived since. Among them we hear of Professor Ritter of Berlin; but there have been few distinguished foreigners at the meeting.

The Great Paper of the Year is generally acknowledged to be Professor Owen's report 'On the Fossil Reptilia of England.' It is a production of extraordinary and minute research, and ought to be published with plates in a separate form. We have often fancied that compliments paid on these occasions were, perhaps, somewhat too high; but we cordially agree with one so well expressed upon the author of this paper—that he *had proved himself a worthy successor of Cuvier* and an honour to his country and its science!

The most novel and amusing Dispute which has arisen has, nevertheless, involved questions of extreme interest to naval and engineering affairs. In Mr. Walker, the harbour-master's paper, 'On the Destruction of Submarine Works by PHOLAS,' the ravages of that boring creature were shewn to be of incredible magnitude; sapping, apparently, the most imperishable materials and foundations.

Dr. Buckland proceeded to state that the SNAIL committed similar ravages in limestone, by scooping out hollows for its residence, and

exhibited specimens of the stone made into catacombs for this purpose. Thus, what the *pholas* did at sea the *snail* did on land.

But the learned Professor's snail-houses were immediately assailed by doubts. Some thought they only crawled into holes already formed by other agencies; and some were sceptical as to their dwelling in such localities at all (though of this there is abundant proof). They are curious rotund chambers, and seem so comfortable, that the nursery rhyme would have no effect upon their tenants:—

"Snail, snail, come out of your hole,
Or else I will beat you as black as a coal."

The Glacier System has received no confirmation in this part of the world. Dr. Buckland has in vain sought for any traces of *moraines* on Dartmoor. This, however, does not impeach the truth of the theory elsewhere.

Among the jokes on the subject we may repeat the pun, that "Though there were no *moraines* in Devonshire, there were *more rains* than enough in every other part of the country." And also the misapprehension of a native here (and the natives of the lower order appear to be rather of an obtuse and Bœotian breed, as if the clouted cream got mixed with their brains), *which* native, repeating the news, told his neighbour that one of the grand London philosophers was running about the Moor looking for *moor-hens!*

LITERARY NOVELTIES.

LIST OF NEW BOOKS.

Figures and Descriptions of Palæozoic Fossils of Cornwall, Devon, and West Somerset, by J. Phillips, F.R.S. &c. 8vo. 9s.—Professor Low's Illustrations of the Breeds of Domestic Animals, Part X. (the Horse, No. II.), 1*l.* 1*s.*—Plato's Apology from Stalbourn, edited by Dr. W. Smith, 12mo. 4*s.* 6*d.*—Tacitus Germania, Agricola, and First Book of the Annals, edited by Dr. W. Smith, 12mo. 5*s.*—Code of Signals for the Mercantile Navy, by Lieut. Walker, R.N. Two Parts, royal 8vo. 18*s.*—Medical Advice to the Indian Stranger, by J. M'Cosh, M.D. post 8vo. 5*s.* 6*d.*—Isadora; or, the Adventures of a Neapolitan, 3 vols. post 8vo. 1*l.* 11*s.* 6*d.*—Naturalists' Library, Vol. XXX. (Marsupials), 12mo. 6*s.*—Evils and Remedies of the Present System of Popular Elections, by J. S. Buckingham, post 8vo. 5*s.*—Dr. Pritchard's Physical History of Mankind, Vol. III. Part I. 3d edition, 8vo. 16*s.*—Alice Russell, and other Tales, by Catherine Williams, post 8vo. 10*s.* 6*d.*—Alpha; a Poem, royal 8vo. 8*s.*—Rev. J. Bourne' Account of the Life, &c. of St. Irenæus, 8vo. 10*s.* 6*d.*—History of Turkey, &c. by Miss J. Corner, 2 cap. 5*s.* 6*d.*—Daniel's Chancery Practice, Vol. III. Part I. 8vo. 14*s.*—Dialogues on the Apocalypse, by H. E. Head, 12mo. 4*s.*—Rev. C. P. Miles's Lectures on Daniel, 2d Series, 12mo. 5*s.*—Sir Isaac Newton's Historical Account of Two Notable Corruptions of Scripture, 12mo. 3*s.*—Poetical History of England, by the Rev. N. Meres, 12mo. 3*s.*

METEOROLOGICAL JOURNAL, 1841.

July.	*Thermometer.*			*Barometer.*		
Thursday .. 29	From 48	to	67	29·72	to	29·68
Friday 30	 49	..	63	29·65	..	29·62
Saturday .. 31	 47	..	64	29·55	..	29·68
August.						
Sunday 1	 46	..	65	29·70	..	29·88
Monday .. 2	 53	..	67	29·88	..	29·76
Tuesday .. 3	 57	..	69	29·66	..	29·44
Wednesday 4	 56	..	67	29·33	..	29·75

Winds, south-west and north-west.

On the 29th and following day, generally clear; the 31st ult. morning clear, otherwise cloudy, with rain; the 1st inst. generally clear, rain in the morning and afternoon; the 2d, morning clear, otherwise overcast, raining heavily during the evening; the 3d, a general overcast, raining from about six till nearly midnight; the 4th, morning overcast with rain, otherwise generally clear.

Rain fallen, 1 inch ·005 of an inch.

Meteors.—We have to remind our readers that the periodical return of these phenomena may be expected to take place on or about Tuesday next, the 10th instant.

Edmonton. CHARLES HENRY ADAMS.

VARIETIES.

Old Age.—A Greenwich pensioner, of the name of William Lucas, died on Monday at Greenwich, at the extraordinary age of 106 years. He had been eighty years in the Hospital, and was one of the few seamen saved from the Royal George.

LITERATURE AND ART.

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L'auteur n'a rien négligé pour que l'exécution du travail fût digne de l'importance du sujet. A cet effet, il s'est fait autoriser, par décision ministérielle, à confier à l'Imprimerie Royale l'impression de son Tableau, dont l'exécution typographique présentait les plus grandes difficultés.

D'un autre côté la gravure des blasons a été confiée au burin si remarquable de Dupuis et Brevière, graveur de l'Imprimerie Royale, d'après les admirable dessins de E. Bourguignon, élève de feu Aimé Chenavard.

Ce Tableau, dont les détails ci-dessus suffisent pour faire connaître toute l'importance synoptique, deviendra, en même temps qu'un moyen d'instruction rapide et précieux, l'ornement des bibliothèques princières publiques, celui des cabinets de tous les hommes qui aiment la science et les beaux-arts.

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